

DR. COLLIER'S
CODE OF SAFETY

18369/8

F. xvii

19/c



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DEATH OF DR. COLLIER.—Dr. G. F. Collier has just died at Hammersmith at the age of 78. The deceased was Physician in Ordinary to William IV., and in his time enjoyed considerable reputation in his profession, but he had so long ceased to practise or to take any active part in it that he was comparatively unknown to the present generation. Studying at Guy's Hospital, he became a Professor there, being one of three lecturers, of whom the other two were his intimate friends, Sir Astley Cooper and the late Sir Benjamin Brodie. He had a large number of private pupils, in accordance with the then prevailing custom, and altogether about 3,000 students were at one period or other under him. He long had a large practice at 32, Spring-gardens, besides his suburban residence, Bohemia-house, Turnham-green, where he passed the last 20 years of his life in perfect retirement. He took his L.S.A. degree in 1819, M.D. Leyden in 1828, and L.R.C.P. in 1831. He was offered the degree of M.R.C.S. by the Royal College, but declined to receive it. Various medical works were from his pen, among them being Collier's "Celsus" and the "Code of Safety," and he was examined before the House of Commons on the Public Health Bill.

TIMES. 28 Dec. 1877.

*This work is presented to the
Actuary of the Equitable Insurance
Office by the Author who thinks
it contains matter of no small
importance to be interested in
insurance.*

*Geo. F. Collier
induced in the above office*

Geo. Hendriks -
1876.

*Bought at sale of books of
the late William Morgan F.R.S.
Actuary of the Equitable Assurance Co.*

THE CODE OF SAFETY;

OR,

CAUSES, EFFECTS, AND AIDS,

PREVENTIVE AND CURATIVE,

AS WELL OF OTHER EPIDEMICS,

AS ALSO OF

ASIATIC CHOLERA.

BY G. F. COLLIER, M.D.

FORMERLY OF MAGDALEN HALL, OXFORD; GRADUATE OF THE UNIVERSITY
OF LEYDEN; AND MEMBER OF THE ROYAL COLLEGE OF
PHYSICIANS OF LONDON.

“Nihil omnino ob unam causam fieri, sed id pro causa apprehendi, quod
contulisse plurimum videtur. Potest autem id, dum solum est, non movere,
quod junctum aliis maxime movet.”

LONDON:

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AND SOLD BY ALL BOOKSELLERS.

1849.



LONDON:
J. GADSBY, WHITEFRIARS PRINTING-OFFICE, BOUVERIE-STREET,
FLEET-STREET.

Melville by Cypar 15th Nov.
1831-

Dear Sir

Pardon my troubling you with
a few words more on the subject of
Cholera Morbus. One of the most safe
cious cautious and active minded
practitioners I have ever met with is
D^r Watson who was in charge of the
medical duties of the City of Benares
for ten years after the commencement
of the Cholera as a Epidemic in
India. I think scarcely any four
Professional men had such extensive
experience in the treatment of the disease
or in directing the application of the
requisite remedies to large masses of the
community. I believe the result is
the adoption of a more rigorous treat

ment than has hitherto been proposed
in this country. Unknown as I am
my testimony can be of little avail
but you permit me to suggest a
if the Committee of the Privy Council
will take the trouble to enquire I
am persuaded my representation
in regard to Dr. Watson's merits will
be amply confirmed. He is at present
residing at No 3 George Street
Edinburgh. I shall not inform
him that I have mentioned his
name, but should any application
be made to him I have no objection
to mine being made use of.

In com-
mon I believe with all persons who
have lived amidst this appalling
disease I deeply lament the promul-
gation of the Rules laid down by the
Board of Health and anxiously

desire the revival of them. This
opinion has induced me to trouble
you more than I should have
done but I beg you will not
consider it necessary to reply
to the present communication

Believe me

Dear Sir

Your very faithful and
obedient servant

W. Leslie Melville

Right Hon^r —

Charles Grant

in

1831

Nov^r 15

^{ble}
Hon. W. L. Melvill

to W. C. Grant

Alfred May 4th

1840

My dear Sir

I am sending a copy
of the 12th of the
and having seen
it with me - I have put off
my coming to Town till

next Monday - I regret ex-
ceedingly the want of my absence
from the Society, but I have
been very ill since we
have particularly with the

of course they suppose you
know the circumstances &
the directors - and that he
hasn't got into
with very considerable
may make.

I got it from one
with a line

Advised

Dear Mr. May

Advised

Yours

With best regards

I am dear Sir

Very truly yours

Wm. May

PREFACE.

To the Consulting Physicians, Surgical-Physicians, and General Physicians of Great Britain, this Code of Epidemical Forces is heartily dedicated. Gentlemen, I here address you by those appellations to which, according to reason and common sense, you are evidently entitled; for neither the term surgeon-apothecary, nor apothecary, nor general practitioner, is to be found in the medical constitution of our country as significative of one medically qualified to take charge of the sick. If, therefore, you are not physicians, you are nothing; and he who would contend that each and all of you qualified so to take charge of the sick is in fact not a physician, notwithstanding the gross blunder in the Apothecaries' Act of 1815, is ignorant of the constitution of this realm. The Charter of Henry VIII. gave the title of physician of the realm to all persons proving themselves by examination qualified to take charge of disease: the mere fact of the College of Physicians delegating their power to a trading company under a covert arrangement, could not in equity deprive such qualified men of that title which was conceded to them by Henry VIII.; and the sudden creation of a new body of medical men under the appellation of apothecaries led to a misnomer, a blunder most embarrassing, and to a fiction in law. The error thus committed—this turning out of the path of our original constitution, has led you, gentlemen, and all your legislators who have attempted to put you right—into a maze without a clue. Let them retrace their steps and regain that path, and their difficulties will vanish like clouds before the sun. But if they draw the line of separation so as still to retain a corporate body, whether practising under the title of surgeon-apothecary, apothecary, or general practitioner, they will perpetuate the blunder they committed in 1815, and their legislation (if they legislate at all) will be abortive and unsatisfactory. Many of you are aware that, when Sir James Graham commenced his unenviable task, I foretold his failure; and also that I afterwards foretold the subsequent failures in legislation; I once more record my prophecy.

The absurd attempt to make it appear that men qualified to take charge of disease can be anything but physicians, has been the root of all the evil of that dissension for which we are unhappily stigmatized; and

the remedy is clear, prompt, and efficacious—however unsatisfactory it might be to the selfish and designing, who seek to profit by our anomalous and unconstitutional division.

No legislator will acquire any fame in adjusting our relative position till he shall have recognized this great constitutional truth ; the jealousies existing in the different departments, fanned as they have been by political excitement into reciprocal hatred or contempt, may be traced with facility to one false step in legislation, by which the most numerous body, the general physicians, instead of being invited to fraternize with those of our ancient constitution, were called into existence under a false and degrading title, not significative either of their function or of their importance.

If my advice were worthy your consideration, I would urge upon you never to be content with any legislative measure which shall fall short of that constitutional fraternization which is your right. Were it not for your discord, there is no class in the community who could be entitled to a higher position in public estimation ; for as regards your utility, your self-denial, your discoveries, your charities, you are not inferior to a proud aristocracy, or to either of the learned professions, to whom access is given to the highest honours of State. Alas ! gentlemen, used up as many of you are, as mere tools of the State and of the public, few, very few of you, either acquire the wealth or the dignity you merit after a laborious life in the rugged and legitimate path of our profession ; while under the fostering protection of a pampered and bloated aristocracy, folly and charlatanery grow in rank luxuriance in a field where the modesty of true science blushes at competition. Meanwhile the State which cajoles you with the assurance of a hearty desire to appreciate your merit, and never fails to flatter you for your disinterestedness, robs you of half your well-merited reward, by giving the royal licence to chemists and quacks, to damage or take away the lives of her Majesty's subjects at $1\frac{1}{2}$ d. a head, as is daily seen in every paper throughout the kingdom, in which advertisements are proffered, holding out constant purgation as a cure for Asiatic cholera.

An imagination less vivid than that which traced the skull of Alexander to the clay luting of a cask, might trace a few of these stamped pence to the ribbon ornamenting the hat of an heir apparent, bearing the imprint, STATE MURDER.

Some of you may, no doubt, have, like myself, freely given the result of your labours to the public without the least reward. I hope I may be pardoned for reminding you that my own discovery of the formula for decomposing sulphate of quinine by citric acid, in an elegant menstruum, would, if selfishly kept for my own gain, have realized for my family

many thousands of pounds : for it is notorious, that it is now an article of consumption throughout the kingdom ; and yet, while the State inflicts a stamp of one shilling upon each quart bottle of the medicine so invented by myself, thereby netting a revenue sufficient to pay ten average medical Union doctors, and has fined several chemists for selling it without such stamp, I, the originator, the inventor, the author of the gift to the public, and the creator as it were of a new source of comfort to the afflicted, have never, directly or indirectly, attempted to profit to the amount of one farthing. Such is my position, and I have no doubt such is the position of many of you. Thus the philosophic pride of the physician shrinks from a means of profit which the State greedily and unblushingly grasps in the Queen's name ; and the profession at large, while with a jealous eye they scrutinise his conduct, if he attempt to make mercantile arrangements, tamely allow government and their agents to divide a reward of which he and his family are despoiled. The nobility of our profession, the patent of which we hold direct from the Deity, leads us, as it did the Grecian legislator, to sacrifice wealth to our love of science and our sense of public duty, and that sacrifice in the aggregate amounting to a sum sufficient to corrupt a modern court. Shall we, holding this proud position, suffer ourselves through our own jealousies and dissensions, to be juggled out of half our income by an unholy copartnership between the State and the unqualified marauder ?

This is a question, an awkward question, to which no member of either medical committee professing to sit for general inquiry has had either the boldness or the honesty to address himself as he ought ; and yet, in truth, this was the substance, while with the shadow alone they have craftily amused us. Thus, while they have diverted from our pockets into their own exchequer thousands, and tens of thousands, and hundreds of thousands of pounds, it is to us they look to teach them the laws of health, and to enable them to avoid for the future those disgraceful blunders apparent to all the world, in their shutting out light and air, and taxing that essential commodity which is most important for cleanliness and health. Shall such men, who with regard to sanatory arrangements are at this time in leading strings, be allowed to affect such a superiority over ourselves, as to exclude us from office and honours which any member of the other learned professions is allowed to aspire to ? Should it please God to increase the intensity of the prevailing epidemic force, to whom would the sovereign and her nobility look as their strength, their fortress, and their refuge ? Now is the time to assert your own rights. It was the sweating sickness that brought royalty and the court to a just appreciation of medicine in the sixteenth century, and gave our ancestors the charter of Henry VIII. Another

such an epidemic will one day impart a second useful lesson, teaching a besotted nobility how far they can mesmerise or homœopathise away a pestilence.

Party politics are beneath the philosophic mind of the physician; and so far from recognising, opposing, or supporting any party, except there be one steadily progressing in the path of philanthropy, I do but echo the expressed and recorded opinions of a censor of the College of Physicians, deliberately transmitted and recorded for the public and for posterity,* that struggles in the great parties of the State for their own selfish schemes of advancement, by which the people of this country have been alternately goaded into the highest political excitement, and then repressed, persecuted, and many of them hanged for outbreaks which were the necessary results of such excitement—each party endeavouring to depress and ruin the other, without regard to the general weal, and making power and patronage of office, and provision for the pecuniary wants of the State, and not the safety of the people, its supreme law—is, has been, and, if great care be not taken, will continue to be, the cause of increase of misery, increase of madness, especially suicidal, and increase of all disease connected with diminished vitality and over excitement of the human breed. Shocking as have been the atrocities committed in France in the fair name of liberty, for every victim who suffered in the revolution, at least a hundred have fallen a sacrifice in Great Britain to the selfish struggles for ascendancy between our Tory and Whig nobility.

Observe, this is the recorded opinion of a censor of our College, to whom a committee of the House of Commons, in their own report on the subject of Health of Towns, pronounced “his opinions to be especially deserving of weight on account of his high official situation in the leading medical corporate body of the nation!” Look all over this kingdom, and tell me whether the greatest revenue by medicine does not pass into the tills of our own chemists and druggists, those government counter-practitioners, supported by government, licensed by government, under the vigilant eye of Somerset House, and into the pockets of illegal empirics, equal copartnered with, and licensed and tolerated, nay, even encouraged, by the State? Neither does the State lose by the system, for it gives an impulse to mortality and to property changing hands, and therefore to the more frequent paying of probate and legacy duties. While with regard to such few of you, gentlemen, who by extraordinary industry, and at the sacrifice of health, may leave to your children some four or five thousand pounds rescued for a time from a Protean system of taxation, under the same system the

* *Vide* COPELAND'S *Medical Dictionary*. Article “Suicidal Insanity.”

government and the legal dispensers of its inner and outer Temples shall devour the lion's share before your bones shall have passed into ultimate dissolution; for, in this country, as the same censor of the College of Physicians has observed, justice and security for wealth is only within the reach of the extremely wealthy, just as laws protect chiefly the bad, leaving the weak unshielded and the deserving without reward, and allowing the myrmidons of the law to commit more wrong than the aggregate amount of all the felony committed in England besides. But if you can amass sufficient to obtain a considerable landed property and a baronetcy, your property shall be comparatively safe for your children, and you shall be initiated into the freemasonry of the State.

The Code of Laws which I have the honour to submit to you, invites your scrutiny and approval. The more you give publicity to them, and thus enlighten an ignorant public, the less prone will they be to be the dupes of empiricism. My information is grounded as well upon a tolerable long life spent exclusively in elaborate study, as on a pretty extensive observation of epidemical disease, afforded me by consulting with hundreds of pupils practising in and near this metropolis. Thus it was my fortune to see many cases of Asiatic cholera in 1832, while the first cases during its present visitation occurred near the river, under the observation of one of those same pupils. All that I have seen satisfies me that no system of treatment can be successful when the damaging forces are most intense, and that we must be content to treat the malady, not by our own darling notions of free-thinking carried beyond its bounds, but by reference to the known laws and effects, as well of poisons as of remedial forces; for, as Dr. Friend justly observes, "Experience is without doubt a great help to knowledge, and no man of sense can undervalue the advantages of it. But it must not be denied, that the *word* is often made use of where the *effects* do not so plainly appear." The same authority distinctly tells us that, "it is the accumulation of suitable knowledge, and the reading, and comparing, and squaring by experience, as well the ancient as the modern writers, that constitutes the physician," not a piece of parchment with a seal upon it, or a government licence, however useful these may be as a confirmation of a man's possessing these requisites. But he nowhere here tells us, nor does ancient or modern literature tell us, that such individuals so qualified can be anything short of physicians. I heartily hope that you may henceforth coalesce and fraternize for your own interest and prosperity; recollecting the opinion of Zimmerman, "That science is a republic, in which no aristocracy or tyranny ought to be permitted;" and commending to your journalists to build up their hopes for comfortable reflections in their old age upon the social improvements they have helped

to advance, not upon political intrigues, or personal animosities, and bickerings for selfish purposes. In parting, may I be allowed to remind you, that twenty years ago I submitted to your notice plans for the building of public and eleutrial baths, and also a treatise upon those of the ancients. Plans prefixed to my editions of Celsus were transmitted over all the country; and such was the apathy of the profession, that your journalists either discouraged me by their silence, or tried to deter me by the severest criticisms, accusing me of a desire to introduce the immoralities of the ancients, and the dangers of pernicious intrigue. We have lived, however, to see the measures carried with the sanction of the State, which ever uses private philanthropy and private exertion as its pioneer, watching the progress with cold indifference and without rendering a helping hand, until one party or another sees a fair opportunity for trading for popularity, when in step our great men, and bear away the palm from the deserving. There is not a single sanatory improvement that may not be similarly traced to the private industry and private philanthropy of medical men for years before the ear of government was conceded to them. In the national buildings, however, which were proposed by the author, and transmitted repeatedly for the opinion and judgment of the prime movers of the measure, ball courts, exercise yards, music porticos, and miscellaneous libraries were recommended as auxiliaries to public health, where the artisan might have an hour's recreation and refuge from the monotony of labour. Let those who would reprove me for prefacing my code of epidemic laws with an exposition of the inteverate atrocities of the State, first read the history of epidemics, and therein learn that to the apathy and misconduct of governments not a few pestilences have owed their origin; and still more frequently, through the like agency, have their ravages been increased.

I remain, Gentlemen,

Your obdt. Servant,

G. F. COLLIER.

THE CODE, &c.

PART I.

CAUSES AND EFFECTS.

1. When a disease traceable on the map of the world, and owing its origin to an epidemical controlling force, is observed to travel over a wide range of the earth's surface, through an atmosphere undergoing subtle changes as yet incomprehensible to mankind, it is called a progressive epidemic. If it be very general, it has been called a pandemic. If it shows itself only in particular localities, it is said to be endemic. Its progression, however, does not depend upon the controlling cause of the atmosphere alone, but also on the condition of the population, and of tracts of the earth's surface favouring epidemical influence.

2. A disease may appear to be endemic at first; and gradually spreading, it may become epidemic, and more rarely pandemic; or it may pursue a somewhat opposite course,—it may at first be epidemic, then pandemic, and lastly fix itself in certain localities as an endemic.

3. That any epidemical or pestilential condition of atmosphere may depend on solar, lunar, planetary, or electrical changes, among other causes, is not impossible; and it is a very ancient conjecture, reducible, however, to no proof, and being merely a conjecture. That such influences or changes of themselves are individually the cause of any malady, is contrary to experience; since the cause of disease is complex, and never single. Such conjectures extended to equally obscure magnetical changes in the centre of the earth are in like manner vain and illusory: for whether as regards the atmosphere we breathe, or the earth on which we move, our references to their conditions can only be beneficial when carried out to an extent at which they sensibly influence health or disease; and as to all conjectural causes beyond such limitation, these, even if more manifest, would alike defy human prevention and human control.

4. Learned medical writers have endeavoured to show that there are epidemics of the mind as well as of the body. The history of disease furnishes us with strong proofs of such occasional inflictions on the human race. Of these, however, it is not now our business to treat.

5. The simplicity of earlier races ascribed prevailing epidemics to the anger of the immortal Gods; and even Aretæus says, "The Gods alone can cure all greater diseases." In this they erred; just as the

masses now err, taking and mistaking one cause for many, since all diseases are regulated, all destroy, or are cured under nature's own laws, which are the laws of God.

6. Theories are not, and never have been, of the least use in advancing the cure of epidemics, except when confined to rational and plain inferences, deduced from experience, and obvious to the many: as, for example, such as lead us to warm him who is cold, to cool him who is hot, to invite the fluids to the skin when they are passing from the outer surface inwards to the bowels—to encourage bile when deficient, or to promote the flow of all secretions visibly failing.

7. In slow or chronical disease there is ample space for a trial or change of doctors and of remedies; but in sharp and rapid diseases there is little time for either, so that the benefit is more doubtful, and prevention more successful than cure. Yet experience shows that, however fatal the character of any epidemic, and however imperfect our knowledge of cure, an early recourse to rational and prudent aids lessens the aggregate mortality ensuing thereon.

8. It is the interest of the State, as it is of individuals, to place common and individual health under the most favourable circumstances for diminishing the force, and breaking the chain, of all those causes which, concurring, produce the disease: for when the

malady has set in, we doctors are at fault, and our remedies notoriously contradictory and opposite.

9. The greatest generator and promoter of all epidemical diseases is, ignorance of cause among all classes, high and low, rich and poor, learned and unlearned, professional and non-professional; for the doctrine of cause and effect scarcely has place except among medical men, and is not generally cultivated even among the masses of the medical profession, as is evidenced by their reports.

10. The exposition of a single cause, or a smart ingenious theory, avails more with the public than the slow and laborious compilation of facts. Hence *Ætiology*, or the doctrine of cause, is unknown to the community.

11. Man's security in a pestilence is best grounded on a natural, elastic state of health, in a body neither too full nor too spare, neither too hot nor too cold, neither too moist nor too dry, neither too susceptible nor too obtuse, neither too rigid nor too lax, not requiring him to live on exact rules, but capable of sustaining him under infractions of rule, and under all ordinary changes.

12. Cause never acts simply or singly. One cause suffices not to produce disease.

13. Authors have tried to distinguish causes into

proximate and remote, simple and conjunct, primary and secondary, predisposing and exciting, or occasional or accidental, antecedent and procatartic—all which scholastic divisions are imperfect, confused, and practically fallacious.

14. Improved Philosophy teaches us to weigh the value of causes individually and in the aggregate by reference to experience; and to derive our methods of prevention and of cure from the consideration, not merely of each one singly, but of all conjoined.

15. Deficient or unwholesome food or drinks, a humid and foul locality, filthy habitations, depraved habits, excessive cold or heat, not duly guarded against, all conjoined may not at once produce disease, but they will insensibly undermine the healthy resistile power, thereby exposing the body to epidemical influence, from which otherwise it had been comparatively secure.

16. This law descends to chronic or slow diseases also, and may be traced through various classes of our metropolitan population. Thus the swilling of beer common among dray-men and coal-porters may not for years produce any visible mischief in their sturdy frames, yet all the while it secretly undermines the resistile or reparatory powers, so that under epidemical fevers, accidents, or surgical operations, they have a remarkable tendency to sink, without making any but feeble efforts towards a righting, or healthy adjustment, of functions.

17. Contact with the sick, or breathing an atmosphere in common with them, or infection, as it is called, will not of itself cause any epidemical attack; but it may, and often does, concur with other causes in producing the spread of the malady. To say that this or that particular epidemic or endemic disease is or is not contagious or infectious, is vain and equivocal; since a community of habits, and of living, and of sympathies, and of climate or atmosphere, and of planetary influence, and of impress under weather, may assist in developing a pestilence which otherwise would not occur. One link does not constitute a chain. To justify the imposition of severe quarantine it suffices not to prove that a disease is communicable under a community of habits, but we must show that it is so to that degree as that the new comers, having the taint in their blood, may give a tendency to the spread of the malady appreciable, notable, decided, and characteristic, for under a community of habits even common colds and coughs become universal in families. But although such community of habits becomes an additional cause, the controlling cause is atmospheric condition. Were a ship's crew to arrive with influenza, quarantine would not arrest its progress, nevertheless strangers going aboard and living with the crew would be more likely to take the malady, to which, by reason of atmospheric condition, they are already prone. Contra: A ship may arrive in harbour with a crew suffering under a fatal, exceedingly infectious fever; and one after another, medical volunteers going

aboard to supply medical aid shall themselves fall victims to it. Here strict quarantine becomes important, although, even when thus imported, human ingenuity could not render this malady epidemic. Out with the men, blow up the ship, and the disease must fade under any proper sanatory precautions.

18. He who thinks that Asiatic cholera, or any other malady, must either be infectious or not, is only clinging to a logical quibble. Infection may be a concurring cause in so small a degree as scarcely to admit of being estimated, or it may become in some epidemics the main and most powerful cause. In our consideration of Asiatic cholera, it is neither to be rejected nor to be over-estimated; but to be justly estimated in regard to health and quarantine. One shilling is not a sovereign, but it is one-twentieth towards it. Were quarantine to be interposed for slight causes, it would cut off all ordinary communication in great societies.

19. No epidemical or pestilential disease proceeds from the air merely, nor from the earth merely, nor from the waters under the earth merely, nor from any one cause wheresoever or whatsoever; but human weakness, in its limited view, assumes that to be the cause which has most notably contributed to the effect.

20. Man's security in a pestilence, or his escape when attacked, is not due simply to remedies pre

ventive or curative ; for his escape or death, even after an attack, depends chiefly on the comparative severity of the blow, or injurious impression made through the blood on his brain or nervous system, or through these on the blood, and on his own natural powers and resources in resisting, and righting him after such blow. Hence many die in spite of the best treatment, many survive in spite of the worst. As the former must not be said to be killed, so the latter ought not to be said to be cured.

21. No remedial agent can be efficient except by its seasonable use. Thus in violent epidemics, medicine properly employed may assist nature in resisting the malady ; but when concurring causes are too powerful, medicine must fail altogether.

22. Looking to the links in the chain of cause and effect, we may infer, not only that some causes operate successively in lowering the rectifying or healthy protective powers of man's body, but that in developing disease, to which such debility the more exposes him, several causes must co-operate together and at once, since each one of itself is impotent to produce disease.

23. People on viewing cholera are much alarmed at the blue or livid appearance of the bodies of the dying, as if it were altogether new, while in truth the same is observed as the result of various poisons, and in sudden death from other causes, as well as in many other epidemics.

24. The symptoms of an epidemic may be well defined, generally or universally well known, easily recognized, so few and terrible as to be engraven on every man's memory who has had opportunities of seeing them, notable for uniformity of character over all regions, and pre-eminently so above those of all former epidemics, and nevertheless such knowledge shall lead to no satisfactory method of cure, unless studied with reference to cause.

25. Under epidemical influence where the amount of force from various causes in any individual falls short of the degree required for disease, accidental damage through some mechanical force, as from a beating, or wound, or fall, is known to determine the development.

26. Under epidemical influence, as in communities so in families, the weak and exhausted, whether such weakness be natural or acquired and accidental, are the first to succumb, *cæteris paribus*, under a parity of other causes. Persons exhausted by previous diseases, and especially by diseases of mucous membrane, are so far the more liable to fatal attacks, because in them the resisting or reparatory powers are already damaged. When the tree is roughly shaken, the weakest fruit is the first to drop.

27. Persons who have recently suffered from intemperance are also very prone to attacks, because in a degree they are poisoned already. Such persons are more exposed to the force of epidemics than con-

firmed regular drunkards. So also persons exhausted by low and deficient diet, or by unusual exertions of mind or body. Hence ships' crews, after laborious and anxious voyages, so soon as they enter into the latitude of the epidemic, often present the maximum proportion of fatal cases. This has often occurred after being three months at sea, and when within a few days' sail off a destined Indian port—the inconveniences and increasing discomfort of a ship's company always playing a part in the tragedy.

28. In great communities, equally as in families, prosperous or adverse condition wonderfully influences or retards the spread of disease. In losing armies, under one and the same epidemic, the mortality is greater than among the victorious; usually greater among the besieged than among the besieging; greater among the poor than among the rich; greater, in mixed nations, among the slaves than among the free; greater among the degraded than among the equal of social condition. Hence in ancient pestilences all over Europe, the Jews were prone to suffer the most, as well from this as other causes, pending the fierce, brutal, and unrelenting persecutions of them by the so-called Christians, who themselves similarly suffered in a marked degree, under Pagan persecution, wherever epidemics anciently prevailed; this, like all the other laws of epidemics, being a law of ages.

29. Epidemics have usually their rise, their climax

or topping point, and their decline and fall. When the atmospheric condition is at its climax of intensity the disease is most rife and communication more probable; but in its decline, cases become in the aggregate more manageable, partly because the force of the blow is diminished, and because, in any community over which the force is exerted, the weakest first go to the wall, and those who more tardily give in are generally endowed with more reparatory or self-righting powers.

30. Ordinarily high atmospheric temperature is favourable, and intense cold weather unfavourable, to the spread of pestilential diseases; but the worst fevers, like Asiatic cholera itself, have often raged at the coldest seasons. The Plague of London did so in March, 1665; and it is notorious that a similar disease has frequently been checked in various parts of the world as the weather grew warmer.

31. An epidemic condition of atmosphere, manifesting itself by an outbreak of acute disease in autumn, is commonly found to make its impress upon, and maintain its control over, the character of all acute diseases throughout a whole twelvemonth, reckoning from the time of such manifestation, and sometimes even for a longer period.

32. A disease may be endemic, sporadic, partial, for nearly a year, and may then become a perfect, regular, and very general epidemic, enduring for some considerable period, usually extending its

influence over the next year, as the history of epidemics heretofore serve to teach us.

33. The Asiatic cholera, like any other epidemic, may be pronounced to be, not appreciably, but weakly, capriciously, and inconsiderably, and rarely infectious during one month or more, and shortly afterwards it may become decidedly communicable, so that proximity and inhalation in common with the sick may become a formidable assisting cause to make up, along with other forces, the aggregate sufficing force. The former condition would scarcely challenge quarantine, or would fain lull its vigilance to sleep with the anodyne doctrine of non-contagion, that sop to Cerberus; the latter is sure to render its occasional resumption imperative and acceptable. Man peevishly demands that Nature should tell him whether Asiatic cholera is or is not contagious. Nature answers him conventionally, by presenting facts embarrassing, difficult, intricate.

34. One may rest assured that all disputes on the infectious or non-infectious nature of Asiatic cholera, as of any epidemic, are either conventional merely as to degree, or altogether absurd; for although infectious tendency may exert only a decimal or a vicesimal and obscure influence, yet, other causes concurring, infection may, as a one-twentieth, either in one or a series of instances, determine the malady, the force of nineteen-twentieths being supplied from other sources, more or less, as the case may be.

35. The additional exciting causes of the disease may all be impotent, and fall short of the required poisonous force, until the deficit be supplied by the circumstance of a further injurious impression made on the stomach or other parts of the digesting canal, either by some gross error of diet, or by medicines unseasonably taken, or by other causes proffered in the form of unwholesome food, drinks, or other poisonous agents.

36. Bodies of our fellow-creatures shut up in hulks, ships, or other crowded prisons, or public receptacles, under depressing circumstances, and leading a life tending to damage the healthy innervation, are especially liable to epidemics: for care and anxiety are poisons, forced and unremunerated labour is a depressing poison, degradation and remorse are poisons, imprisonment is in itself poison to a lofty spirit, and also generates poisonous exhalations; for whether large bodies of degraded men are cooped up in prison ships, or in crowded buildings, as instanced with regard to prisoners of war in all countries, a difficulty of keeping them healthy will always and everywhere be experienced, just as rabbits and poultry when cooped acquire an increased tendency to murrain.

37. The total separation of the sexes, at any age, increases the liability to epidemical influence, whether as regards exclusive female communities or exclusive male communities.

38. Numbers of persons domiciliating in large poor-houses situated in healthy localities, and having the advantage of prudently-chosen labour, exercise grounds, diet, and management, though in other respects placed under disadvantageous circumstances of depression, suffer under less active forces than those who are pent up as degraded prisoners, doomed to long labour under circumstances more strongly depressing.

39. Malignant disease is nothing new in our unhealthy localities, especially near rivers so far up as the great embouchures of populous towns may extend, nor in crowded poor-houses, nor in crowded jails, though much less frequent since these matters have been better understood.

40. History and our own experience teach us that certain impressions made through the mind act like poison: certain impressions, as damp and cold, act like poisons, as well on the skin as on the lungs: the air acts like poison when it passes into the epidemical condition; and its damaging force is more than doubled when it is further contaminated with filth inside and outside man's habitation. So also food of a bad quality, deficient or excessive, yields another poisonous impression, and spirituous and fermented liquors improperly used, as the putrid breath thereby induced will serve to testify. Not one, but several, or a consummation of all under

epidemical influence, gives the crowning force sufficient to develop epidemic disease.

41. A state of flesh too tight or too loose, but the latter condition especially when it extends to the bowels, has been known through several thousand years to be dangerous during sickly seasons. In the reign of Tiberius Cæsar, who was contemporary with our Saviour's sojourn upon earth, the Romans were instructed during pestilence not to allow looseness of their bowels, but to restrain them when relaxed.

42. If a man has a weight upon his shoulders or head, and he receives a severe blow on his stomach, it will probably kill him. If, when powerless on the stool with relaxed bowels, a similar blow be inflicted, it would most probably kill him. An epidemical stroke is a blow—Asiatic cholera is a blow; a great moral weight, pressing in a moral sense on the head and heart, may also be dangerous.

43. During former visitations of great epidemics as also during the last visitation of Asiatic cholera, in 1832, when husbands and parents have in despair thrown themselves upon the dead immediately after bereavement, they also have been shortly attacked, and have fallen victims to the malady; not simply under the force of infection, but also under the previous forces of sympathy, community of habits, community of atmosphere, and community of climate. The medical attendants, neither depressed by the

same torturing sympathy nor by the like apprehension, are comparatively exempt from danger.

44. Many diseases become infectious under a community of habits to persons already prone to them. Consumption, which ordinarily no one dreads as infectious, may in this sense become so. There are many instances of this kind in large communities, and they are recorded and verified beyond all doubt. In extensive female seminaries first one girl has been known to have St. Vitus's dance, then some of the girls have imitated her awkward movements and gesticulations, till at length a great proportion of them have had the same malady, communicated because communicable, under a community of habits, even without infection.

45. In all communities, large or small, the spread of an epidemic bears a relation to the panic pervading the community.

46. It has been stated in a former paragraph (27), that persons committing a sudden outbreak from regular habits are more liable to epidemics than drunkards inured to poisonous fluids: so also those who are inured to filthy habits and a foul atmosphere, if too suddenly removed after attack to a purer air, have their danger increased, as has been proved in the typhoid fever of Glasgow and of Edinburgh. This may at first appear improbable, but it exactly squares with the ancient aphorism: "A sudden

change from a foul to a salubrious atmosphere is dangerous." All sudden changes are dangerous.

47. In common parlance it is said, "Such a man died of typhus, or such a man died of cholera;" but we are wrong, for they died from the causes of the disease. All the commotion and disturbance thereby occasioned were efforts of the human body to struggle with, and to overcome, the poisonous forces by which the disease was caused; and these efforts when successful are in fact the cure, whether assisted by medicine or left unaided. Oxidised arsenic, or any other poison, produces a great disturbance; and even when the sufferer recovers he escapes by that very commotion, of which vomiting is the ordinary prelude, sweating and purging the subsequent effects. We do not say he died from the commotion, but from the effects of arsenic.

48. Causes differ in force or intensity as well as in kind. Three causes, whose intensity or force may be respectively represented by the figures 3, 4, 5, shall produce a disease more fatal than five causes, each represented by the figure $2 \times 5 = 10$.

49. Epidemical diseases have ever committed great ravages in jails and prison-ships near, or in, large towns. The atmospheric condition, coupled with other causes, shall be inducing scarlet fever and typhus, but not Asiatic cholera; which latter for a time shall be limited to the community of prisoners

where it made its outbreak. There exclusively it shall be rife and fatal. Now, such atmospheric condition pervading the town being represented by the figure 2, may within the jail or prison-ship, by reason of its damp locality, be equal to 3; the crowded habitation or vessel may supply a force equal to 4; mental depression under a community of habits, 4; effluvia from the sick a force equal to 3. Thus we may see why, for a time, the disease may be limited to the prison or hulk. Let the epidemical force in culminating rise to a maximum of nocent power equal to 4, the mental depression or popular alarm to 2, and individual exhaustion or damage on any surface external, internal, or sentient, to 6, and then the sum of the combined forces shall produce cholera on the population of the town also.

50. Authors have insisted too much on the division of causes into primary and secondary. This division is fallacious and altogether unsound; because if it be admitted that no one cause can produce disease, but that two or more must concur, it follows that no cause can be primary. In truth, man assumes that to be the primary cause which in his view, and as far back as he can view, has given the first damaging impression to the body, forgetful that, though it may lower the standard of health, it cannot produce disease till another shall be offered; and the two or more acting together, and at once, do by their combined forces develop disease. Thus when a writer traces the origin of a typhus fever to the taint of the blood,

or to acrid effluvia from the human body, he leaves out of reckoning many causes which must have concurred to produce the zymotic action. In like manner a greater number of causes of less individual intensity, and some of them escaping human observation, may, when concurring, produce the same effects, being influenced by atmospheric condition, by the seasons, and by prevailing weather.

51. Again: there are individual and even family temperaments so prone to suffer from the influence of epidemic conditions, that such natural tendency alone may be valued at 2; which, added to any three causes availing 10, may induce a disease requiring for its production a combined amount of damaging or noxious force equal to 12. Hence some few medical men have repeated attacks, while a vast majority escape altogether.

52. Man has an outside surface, an inside or canal surface, a breathing surface of air passages, a sentient nerve surface, and a fine smooth serous surface in all his cavities. Suppose the epidemical air to act as 2, damp and cold as 2, an injurious impression made by surfeit in food or drink as 4, and an accidental blow, or wound, or fall, or temporary exhaustion from inanition, as 2, added to mental depression availing 2; then these combined forces shall arrive at a sum of poisonous force equal to the production of the malady; and the outbreak shall be sudden, violent, and fatal, or moderate, controllable, and safe, accord-

ing to the degree of rectifying power natural to the patient, and according to other circumstances.

53. Some epidemical diseases preferably attack the younger, some the adult, some the old; some attack the fuller in habit, others the spare; some the sanguine and light or red-haired, others the dark or atrabiliary, as they were formerly called; some males chiefly; some females chiefly; others both in common. Some attack the first age chiefly: while cholera attacks all ages, except the first septenary, within the limit of which, however, a few cases have been recorded.

54. A noxious impression may be acting a considerable time on either of the surfaces above-mentioned, on the stomach for example; but if pending this obscure state, new irritation be accidentally offered to a second surface, the most formidable disease may be developed. A man, having had his bowels and digestive organs in a torpid and foul condition, receives a painful wound in the hand, or the foot, and in three days dies of a lockjaw. A child under a similar condition of bowels, may have a severe burn followed by the same effect. Thus also some parturient animals left out in the cold die of the same disease, arising in them from the combined effects of the suffering of throe, humidity with intense cold, and a previous weakly condition of their digestive organs under indifferent feed. Two or more irritating impressions, made on two or more

surfaces, appear to be conveyed to the spinal marrow and brain, and thus excite such a morbid reaction from the brain's centre to each of these surfaces, as may continue independently of, and after one of these irritating causes shall have been removed.

55. The same laws which are observed with regard to pestilential epidemics apply also to fevers, inflammations, sore throat, influenzas, eruptive fevers, and to acute diseases in general. Some are almost limited to their own month, as English August cholera and cynanche laryngea; some to spring or autumn, others to summer or to winter. Yet there are some which attack at all seasons, and Asiatic cholera is one of these.

56. As the poison of disease and the poison of drugs may rarely, yet occasionally, be dormant in individuals for an unusual period, so in large communities a popular or epidemical malady may be repressed and become extinct for a short time with or without remarkable alteration of weather, as at the approach of winter; and many months afterwards, as for example in the spring, it may break out with redoubled fury and with all its original characteristics enhanced.

57. A disease may be slightly epidemic, more epidemic, or excessively epidemic. These degrees may be indicated by the terms subepidemic, epidemic, and perepidemic. When disease frequent in

certain localities exclusively, acknowledges terrestrial and domestic causes decidedly, and epidemic causes obscurely and imperfectly, it is said to be endemic.

58. As the various resistile power of individuals to noxious impressions, influences the longevity of the individual, so the same varying resistile power influences the prolongation or the extinction of family and of race.

59. It has been triumphantly put forth in proof of the contagious nature of cholera, as also of other epidemics, that the ingress of a stranger sickening on the day he entered into an intact community of the village where he had arrived, and the immediate succession of fatal cases in that same community, has been noticed again and again. With equal triumph it has been represented that individuals have with impunity lived, boarded, and, during the conflict of disease, lain alongside the dying, in the same bed, to prove their self-confidence in their own opinion of the non-infectious nature of the malady. Whether we contemplate the antagonization of two such instances or of two thousand, they only serve to neutralize each other, while they offer natural and internal evidence that, other causes concurring, the ingress of a tainted individual may supply extra force of cause to a sum as yet deficient, and that in the absence of a previous amount of force, contagion, whether by contact or infection, is impotent to produce the malady.

60. It has been insisted upon by the early advocates of the humoral pathology, that in all epidemical diseases a poison is inhaled, or somehow introduced into the blood, or generated within it; and that nature, under the poisonous impression so produced, strives, by means of a powerful commotion, manifested by certain violent actions, to detach and to throw off the tainted particles by sweat, diarrhœa, eruptions, vomitings, abscesses, boils, or fluxions from the secreting glands. But further experience and observation have taught the moderns that a violent impression made on the nervous system also suffices to produce a fever, either continued or intermittent. Fits of ague have followed the use of the knife. Cholera has ensued on local injury. A regular continued fever may follow upon mental emotion, in this, and all instances, other causes concurring.

61. Torture is a poison; anger is a poison; acute suffering is a poison; mental agony is a poison; and under the impressions thus suddenly inflicted, the secretions may become as suddenly altered, damaged, tainted, to such a degree, that a violent and even a putrid fever may be incited; which, however fatal, is intended by nature to repair the damage. The experienced physician can supply from his note-book many examples within his own observation. The angry mother has been known thus to poison her suckling, by suddenly vitiating her milk under violent excitement. Man and beast, under torture, have been known to inflict poisonous wounds with their teeth.

62. The greater epidemical forces, from that which in ancient times produced the Black Death down to that which is the controlling cause of modern Asiatic cholera, have been traced over half the globe, ravaging all nations more or less, no matter what their habits or diet, as well the rice-eating millions of the East, the grease-devouring hordes of Russia and the North, as far as to the Arctic Pole, the complex feeding communities of the more civilised portion of the European continent, and the consumers of solid, substantial food and strong drinks of our British Isles. National peculiarities of habit or of diet rarely arrest their progress, but they serve in a marked degree to modify the intensity of the impression and the aggregate amount of death ensuing.

63. The sum of health differs in nations, classes of society, and in individuals. Hence the resistile power to noxious impressions also varies, not only with the strength of the individual, but in temperaments, in breeds, and even in children of one family. So, also, there are a few born with such a degree of resistile power or retentiveness of vitality, as to be able to antagonize a pestilence under such unfavourable circumstances as avail to take off nearly an entire community; and the same may be said of individuals with regard to other poisons.

64. As an epidemical condition of the air of itself has not force enough to produce any pestilence, so, on the other hand, you can have no general or national pestilence without such condition of the

air. Mr. Howell and others who emerged from the Black Hole of Calcutta were afterwards seized with typhus fever independently of epidemic influence; but they suffered from concentrated breath-poison, just as from any other poison, without propagating an epidemical disease. The forces of animal exhalation in this instance operated in a marked and fatal degree, under extraordinary circumstances, rendering the controlling force of epidemical influence unnecessary to complete, or make up, the sum of destructive force. Similar effects were observed in our own time, when, during a religious procession, the younger population were shut up in a church at Malta.

65. It has been set forth as a characteristic of Asiatic cholera, that it may recur and again affect the same individuals, a feature which has been occasionally noticed in epidemic typhus, and stands on record in the history of most epidemics.

66. The liability to sudden and fatal effects of all poisons is diminished by habitual use. Hence physicians, spiritual visitors, and nurses, incur less risk than other persons, even in epidemics of a more positively contagious character.

67. As in wounds, so in epidemic disease, the danger is calculated on the extent and importance of the parts damaged, and on the known favourable or unfavourable condition of the patient's constitu-

tion; for an epidemical attack, so far like a mechanical injury, destroys or damages more or less extensively, according to the severity of the blow and the strength or weakness of the recipient body. As in wounds, portions of flesh or whole limbs sometimes slough, separate, and are thrown off, so also in malignant epidemics sometimes half the blood is destroyed and detached, sometimes the ends of the fingers, sometimes one hand or foot, sometimes both feet, as was the case with some of the volunteer British Legion who had malignant malaria-fever during the last civil war in Spain; and the same effects have in former times been noticed by the early physicians of England, when draining and cleanliness were less attended to.

68. Terrestrial poisons, animal poisons, vegetable poisons, chemical poisons, morbid poisons, as, for example, the venereal and scorbutic, all occasionally produce destruction in the blood, made apparent to the plainest understandings as well by putrid alterations as also by hæmorrhage, by diarrhœa, or by dropsical escape. One of the most notable proofs of the intensity of a noxious impression or injury, whether from an epidemical disease, or from a poison, or from mechanical force, is proffered to the medical attendant's notice in a sudden suppression of urine, when the kidneys or bladder have not been previously diseased.

69. During the prevalence of pestilence no domestic habitation is safe merely by reason of cleanliness

and strict sanatory arrangements observed by the inhabitants; for if the same care be taken in a whole row of houses, save and except in one near which filthy accumulations, undrained cesspools, or putrid matter of any kind, or stagnant water shall be allowed to accumulate, it is obvious that the wind so setting in as to waft the effluvia into the adjoining habitations or premises, the effects of the poison may reach the inhabitants of any building in the entire row. On the 11th of May, 1750, at the Old Bailey, the prisoners were kept nearly a whole day in small, ill-ventilated, and crowded apartments, some of them then labouring under the jail fever. When they were brought into court, the windows at the end of the hall, opposite to the place where the judges sat, were thrown open. The people on the left of the court, on whom the wind blew, were infected with malignant fever, while those on the opposite side escaped. The Lord Chief Justice and the Recorder, who sat on the Lord Mayor's right hand, escaped; while the Lord Mayor and the rest of the Bench who sat on his left were seized with the distemper. Many of the Middlesex jury, on the left side of the court, died of it; while the London jury, who sat opposite to them, received no injury.

70. During the prevalence of a contagious epidemic like Asiatic cholera, which at present has no decided contagious character, persons near the sick, without having the disease, may infect others more susceptible than themselves. An accoucheur cannot

take on puerperal fever ; but he can, and often does, convey it to his patients.

71. Collecting various already recited laws of epidemical forces, it may be inferred that persons may inhale the material of infection with impunity, if not previously or soon after subjected to the power of debilitating causes ; and further, that there are persons, classes, particular ages, and particular constitutions altogether safe from them by immunity natural or acquired.

72. The appearance of a new epidemical disease in any country ought not to excite surprise ; for good reasons were proffered by John Hunter, and by others after him, for believing that under the modifying force of epidemical influence new poisons are constantly produced among the poor of great cities. A collection of causes rarely concurring may produce malignant and fatally acute disease, simulating epidemical disease, without epidemical influence ; but it is contrary to the experience of ages that such disease should permanently spread itself over a great extent of country, unless aided by meteorologic influence.

73. The morbid changes made by the same epidemic, and apparent on dissection after death, will vary in different countries, according to the habits of the natives, the nature of the climate, and the previous condition of the sufferers, the weakest, or

previously hardest-worked, or most abused organs suffering the most.

74. In the works of the ancients, as also of the moderns, down to a period comparatively recent, although we ransack all the stores of the at any time civilized world, while we may find some faint resemblance in here and there a feature of ancient epidemics compared with Asiatic cholera; yet no parallel is afforded to guide us in our method of cure. In this dearth of information, this darkness, in which we vainly lose our time in searching for some beacon-light of analogy, we are only suffering under the same difficulties as have been endured, grappled with, and triumphantly overcome, by the philosophy of former ages, when small-pox was a stranger, plague was a stranger, black death was a stranger, sweating sickness was a stranger, jail fever was a stranger, lues was a stranger; at least, overcome so far as the known nature of each of these maladies respectively would admit.

75. Sudden prostration, sudden relaxation, collapse, and death, without development of fever, have been known, rarely indeed, but sometimes, in small-pox and in all epidemics; and these with diarrhœa, apoplexy, and suppression of urine and of bile. Again: with regard to the suddenness of death or rapidity of recovery, taken apart from the other features of cholera, a parallel is not wanting in the histories of other epidemics all over the world. Such

sudden death only shows the greater prostrating or killing power of the combined forces, just as a greater dose of prussic acid or of alcohol in any form, if taken neat and at once, will kill almost instantaneously, throwing the man off his legs, and producing universal helplessness of limbs, so that he shall die without development of disease. For as all perfect analogy fails us, whether we attempt to deduce it from our knowledge of epidemical continued fevers, or from ancient history of epidemical intermittents, except so far as we may see that Asiatic cholera must be ascribed, like these, to the influence of a subtle poison under auxiliary causes, we must rather look to the known laws by which poisons exert their influence and produce their special effects on the human body.

76. The poison of small-pox exerts special powers, and produces special effects on particular organs. So also the poison of typhus, whether acquired or generated; so also scarlet fever; so also whooping-cough; so also epidemic and endemic erysipelas; so also chemical poisons; so also vegetable poisons; so also animal poisons, whether the production of disease or natural to the animal. Each respectively produces special effects not to be induced by any of the rest, and each develops its force on those organs to which, by the immutable laws of nature, it is referred. It is by the same law that jalap purges, mercury salivates, antimonials sweat

or vomit, opium lulls pain, cantharides vesicates, foxglove promotes the urine.

77. Wise physicians of all ages, whose fame is immortal, have averred that our remedies for new disease, like our antidotes to new poisons, are to be looked for in the path of analogy and in the path of experience; and they have added, if the first fail us experience is our only anchor of hope. Had small-pox appeared at Athens or at Rome, as we may gather from the philosophic style of their physicians, they would not have proceeded to arrest the pestilence by the exhibition of violent poisons, suggested by ingenious theories, each trying to immortalise himself by the introduction of some new heroic remedy; but they would have advanced with modest, firm, yet cautious step, and step by step, to explore the safe, though thorny and difficult, path of induction from experiment; just as the wisest, most learned, and most laborious, though hitherto not very successful pioneers, have done all over the civilised globe, wherever Asiatic cholera has committed its ravages.

78. In all violent epidemical diseases there is one uniform, immutable law of forces, recognised by their effects during life, and rendered still more palpable by the appearances of the animal organs after death, declaring that important vital organs must suffer congestion or stagnation in their blood-vessels in a degree corresponding to the strength and

vigour or debility of the patient, and to the amount of force of the conjunct causes whence in the aggregate the blow came. This law applies also to Asiatic cholera as indisputably as it has been found to apply to all previously known epidemics. This same universal law applies also to the effects of poisons in general, palpable, notorious, indisputable, and easily to be recognised in all cases, except in those where death occurs too rapidly to admit of such development.

79. Even where destructive force is offered, and limited to a small tract on the body's surface, too insignificant to endanger the commonwealth of the body, the same law controls and produces the destruction of the part—first, a blow or a poison, then a tumult of nerves and vessels, which, if victorious, leads to some reparatory action, or, if inadequate, ends in congestion and local sloughing, which is local death.

80. The remedies which we apply to the surface of the body to arouse its energies, are known sometimes thus to end in local death, instead of local vesication, and the same may be asserted of some internal remedies incautiously exhibited. The effects of arsenic, and of other acrid minerals, are well known, and are reduced by the able investigation of modern authors to a sort of code; so also the effects of opium, and of other lulling narcotics; so also the effects of strychnia and of other acro-narcotics; so also of hydrocyanic acid and of other sedatives; so

also of cantharides and other acrids; but as to what the effects of all these combined and exhibited in minute but poisonous doses might be, the philosopher knows nothing; but philosophy has not now to learn that when Nature, busying herself in her great laboratory—the world and its circumambient atmosphere—inflicts poisons upon mankind on a scale of awful grandeur; even when these are imperfectly collected, as in grosser marsh malaria, they defy human analysis or human comprehension. We know that a mucous cloud is given off from the body of an Asiatic cholera, and a putrid effluvium from that of a typhoid patient, which hangs around the victim during the course of the malady, and from which when collected in the first case, unhealthy mucus may be obtained, and in the second, foul gases.

81. Again: the effects of lightning from the heavens, the effects of sun-stroke, of the rays in certain latitudes, of atmospheric cold and damp, of marshy undrained lands, of decaying animal and vegetable matter, of the more palpable terrestrial exhalations, whether local and mephitic, like those of the grotto del Cane, or general and malarial, like those of the Pontine marshes in the vicinity of Rome, or of those spots in Lincolnshire and Essex, where the sun always sets upon cases of ague,—all respectively furnish matter for deep reflection; but where several of them act conjointly, they defy all human analysis and all human comprehension.

82. The history of all epidemics will serve to convince us that, after their blow is inflicted, we have only to economise, to nurse, and to direct the residuary powers surviving the blow, and that, if these be deficient, all remedies are useless. Cinchona cures ague, cures malaria fever; but in latitudes where the impression of malaria primarily produces dangerous prostration, cinchona only hastens death.

83. To speak of other fatal diseases: the greatest physicians among the moderns have finished a long life by recording, that they have never cured a single well-defined case of acute hydrocephalus, while we in our time are horror-struck if half our cases of Asiatic cholera defy cure; with one evil we are familiar, the other is comparatively a stranger: yet the mortality from acute hydrocephalic fever, compared with cholera, has been as twenty to one. The same social sanitary laws and precautions which diminish the liability to the one malady will tend to prevent the other, and many others, just in proportion as they tend to improve the strength and vigour of the human breed.

84. It has been rightly observed by Annesley, who merits a place among the true philosophers who have written upon epidemics, that the symptoms of Asiatic cholera, whilst they differ widely from those of every other epidemic heretofore recorded, very nearly approximate to the effects of tobacco

upon individuals not accustomed to that poison. First, giddiness and an uneasy sensation in the stomach, with diminution of sight, of hearing, and of perception of surrounding objects; then confirmed prostration, universal relaxation, spasm, if any, of a clonic character, vomiting, sudden relaxation of the bowels, small weak pulse, weak palpitation of the heart, chilliness of the surface, or cold sweats if any; universal pallor, sepulchral or dying voice, sunken eyes, total and absolute indifference to surrounding objects, a willingness to die, as if absolved from all earthly, or social, or religious obligations; corresponding in that respect with the feelings experienced in sea sickness, to which the effects of tobacco are more nearly allied, in so far as that thirst is absent.

85. When persons accustomed to the poison of tobacco use it in excess, although it may not produce vomiting or universal relaxation, nevertheless it will be followed by diminished power of the capillaries on the surface of the body, sensation of cold, fluttering heart, dreams of indescribable horror, with night waking under feeble palpitation; and so extraordinary is the continued effect of the habitual use of tobacco, that the experienced professor can detect the tobacco pulse, and select smokers from his class of pupils. The known effects of a simple poison thus afforded by nature, if combined with minute quantities of arsenic, or of some other acrid poison, might be expected to complete

the parallel, so as to afford a perfect counterpart of the ordinary symptoms of Asiatic cholera.

86. As there are many persons, many temperaments, and even some races, who have the power to resist the effects of moderate doses of tobacco, under which others soon succumb, so there are many individuals upon whom the poison of Asiatic cholera cannot exert manifest effects.

87. In treating typhus the physician guards against congestion, nurses the residuary powers of life, encourages the secretions, and awaits the efforts of nature. The same outline of duty, with some modifications, satisfies him in all acute diseases; but in Asiatic cholera the suddenness and rapidity of the disease throws him off his guard and out of the path of true science, and tempts him into that of empiricism. That desperate diseases require desperate remedies, is an aphorism suitable to the age of infant medicine, but not at all according to the present state of science, surgery scarcely excepted.

88. Three persons shall be struck down with lightning: one shall be killed on the spot, the second shall suffer to a degree requiring medical aid, the third shall be embarrassed only for a few hours, and recover without the aid of medicine.

89. Three husbandmen shall be sun-struck in harvest-time: the one shall be conveyed home, and, under

the best treatment, shall die; the second shall suffer such damage in local innervation * as shall lead to congestion and inflammation, successfully to be combated by judicious remedies; and the third shall get well before the doctor has seen him. All such cases, and many others too tedious to advance, are illustrations of the effects of meteorological forces on the human body. On the field of battle such meteorological forces, combined with the excitement, have often proved fatal to the survivors after the victory, exhaustion concurring as a cause; and it is under meteorological force, along with exhaustion, that during the exercising of troops men fall sick in the ranks.

90. Three persons shall be suddenly immersed by the upsetting of a boat, the weather being intensely cold. Though rescued, one shall die from the combined effects of cold, previous exhaustion, and fright, superadded on previous debility of some vital organs, leading to congestion, inflammation, and destruction. The second shall have a severe cold, and recover with difficulty. The third shall escape intact; or all may escape, according to the intensity of the impressions, and the degree of vigour and of strength, or of self-rectifying power of the body.

91. If the surgeon treating a patient for concussion of the brain were to strike his head with a mallet, in order to cure him, and yet the patient should survive and recover from both impressions,

* Healthy power of the nerves.

such recovery would be due to some extraordinary reparatory or self-rectifying powers inherent in the patient, and not to the eccentric method so instituted. In like manner, if patients in Asiatic cholera survive and recover after being further relaxed and paralised by tobacco and other poisons equally extravagant, such escape from death only serves to illustrate human endurance under great resistile or self-rectifying power.

92. In typhus characterised by stagnation and inflammation of the lungs, if when a vein is opened the blood first flows dark and thick, afterwards streams more freely, and of a bright red colour, the patient is soon relieved. So also in Asiatic cholera. But if the blood continue to flow dark and ropy for some time, gradually becoming more languid, and then stop, death is accelerated, for this is merely the accumulated blood of the larger veins.

93. Diminution of the temperative power of the body is the general effect of all poisons, epidemical, aerial, miasmatal, animal, vegetable, mineral, and mechanical; and even where poisons or injuries are offered to parts of the body, such reduction of temperative power, whether as to its antagonizing surrounding heat or cold, is oftentimes traceable throughout the remainder of life. Epidemical force, like violent mechanical shocks, may thus leave its permanent impress on the constitution, or on special organs, as was formerly noticed with regard to the Walcheren

fever, and is now noticeable in cases of Asiatic cholera.

94. The surgical physician contemplating extensive injuries in a patient just brought to the hospital, takes his prognosis and regulates his remedies by reference to the violence of the shock, the importance of the parts injured, the age and probable degree of vigour and strength of the sufferer. If these circumstances be unfavourable he knows death is certain, and he palliates suffering as far as is practicable. But if there be reasonable chance of success, he grounds it on a prudent direction of nature's efforts, on nursing and economizing her resources, in saving further wear and tear of the powers, on equalizing circulation, on securing occasional sleep as an inter-repose to increase endurance; on regulating the secretions, and on placing the sufferer under the most favourable condition for rendering reaction safely subservient to reparation, since after all impair, there must be repair. He never seeks to combat monsters of the imagination deeply lurking in some unknown corner of the circulation or nervous system; neither is he surprised if his patient's fluids become tainted under the fever of reaction, for he knows that some extensive mental and mechanical forces are capable of causing all this, other causes concurring.

95. Epidemical strokes, like extensive mechanical injuries, if curable at all, absolutely require prompt

assistance in proportion to the force of the blow or extent of injury. Whether a man has Asiatic cholera or several smash-fractures of limbs, he will suffer prostration and feebleness of circulation, especially on the outer surface, and reaction towards the surface is essential in all cases. Exposure to cold and a delay of remedies, under either affliction, increases the danger.

96. All damaging forces, from the epidemical and the least comprehensible down to the mechanical, the most easily understood by the human mind, may be resisted for a time corresponding with the degree of vigour, strength, and constitutional peculiarity of the recipient. We are not to suppose that the action of such causes was limited to a short period prior to the development of prostration; for we know by ordinary experience that all sorts of injurious impressions may be resisted for a shorter or longer period, and that immediately as the resistile power fails in its antagonization, sudden prostration manifests itself, and the human powers are overcome.

97. The effects of meteorological forces familiarly illustrate this law; the effects of spirituous and vinous drinks still more familiarly; the effects of blows in the school of boxers proffers itself as a mechanical illustration; and, in their language, those who can bear the greatest amount of injury are facetiously called "gluttons." The same law applies to all the ills that flesh is heir to.

98. Constriction of tubes and suppression of certain secretions, with flux from the bowels, is a common effect of poisons and of blows. If it occurs in epidemical Asiatic cholera, so also it occurs from violent mental emotion; from cantharides; and from mechanical violence.

99. In all epidemics, the collecting together of a number of patients under one roof, in community with others intact, increases the force of contagion otherwise insignificant, and in the abstract, diminishes the chance of recovery. But such increased hazard may be more than counterbalanced by the superior accommodation, and more complete adaptation of aids insurable in such hospitalization. The same applies to Foundling hospitals, Lying-in hospitals, Cholera hospitals, and all Hospitals.

100. Although there are numberless diseases which originate from, or are renewed by, the seasons and the weathers, yet some of the most fatal epidemics which have ravaged Europe, and have travelled from the Indies all over the world, have neither owed their origin to heat nor to cold, neither to drought nor to excessive wet; but from the time of Hippocrates down to our own era, have been uniformly referred to meteorological and terrestrial influences combined, as a controlling cause, however occult and inexplicable.

101. But when authors speak of the travelling of epidemics, let us ask them what is it that travels?

Do they mean the form of the disease, as progressively seen, and traceable on the map?—that is mere poetry. An ideal form travelling over the world?—that is metaphor. Again, what travels? disease without the man?—that, as regards cholera, is not proved. The man without a germ of disease?—such a man would be superior to the first Adam. The man with the disease?—even that would be insufficient, admitting him to arrive where epidemical condition is not existent. The fomes or impurities given off from the patient, and conveyed in linen, clothes, or goods which have stood near him?—that is intelligible with regard to plague, or scarlatina, or small-pox, but as yet remains to be proved as regards Asiatic cholera. No number of cases could influence meteorological changes, and the disease so introduced would soon disappear and fade, like a plant introduced into a climate and soil unfitted for it. Is it the meteoric force that travels, developing disease in smaller or larger communities, or in individuals, when that force coacts with such spots of the earth's surface as are in a condition to respond to its impression, and to give off under such meteoric impregnation subtle poisonous particles? Why then does cholera first appear in our ports? The answer is in the next recorded law.

102. This is the law of epidemical diseases. Epidemical condition of atmosphere and of earth may traverse the whole globe, independently of national communication; but community of habits on a vast

continent is always an auxiliary force. Community of habits on board ship is always an auxiliary cause, out at sea and in all latitudes, and national intercommunication must therefore be an auxiliary cause. If the cooping up of a number of men in a crowded prison ship is sufficient to develop the disease under epidemical influence, the cooping up of a number of men who have recently lived in a community of habits with a population already visited by epidemic force, is still more likely to produce the disease, other causes concurring. And herein lies all our knowledge of conjunct causes. We cannot recognise meteoric force, except by the mind's eye, nor terrestrial emanations, except those of a grosser quality, for many are imponderable, and like nitrogen, invisible, inodorous, insipid, and altogether inappreciable to our senses; but corollary evidence of their existence is not wanting, just as corollary evidence of the existence of nitrogen is not wanting.

103. If in Asiatic cholera the epidemic stroke depended on the electrical state of the atmosphere and of the individual merely, we should not find the disease clinging to certain localities, and for the most part leaving mountaineers intact. British philanthropy has caused the material of the vaccine disease to travel over the greater part of the world; but Asiatic cholera has as yet given very weak, and no conclusive, evidence of its being transportable, either by inoculation, or by fomes accumulating in the patient's linen or clothes.

104. In all new epidemics, from the black death downwards, traced from the reign of Edward III., and in the more expanded space of ancient history, derived from Grecian, Roman, and Arabian authorities, as well as from Chinese and Brahminical tradition, we learn that such new forces first commit their ravages on the lowest classes of society; but as contagious force gains ground so as to reach the upper classes, these suffer the greatest mortality, in proportion to the number of cases supplied by, and occurring in, such classes. This may not be manifest in a first visitation, but has always been verified in the sequel.

105. Disease developed under epidemical force may prove mortal instantaneously, or at any time within three weeks, according to the type of the epidemic. The plague at Constantinople, in its second return in 558, commonly killed instantaneously, most of the attacked dying in a moment, as if in a strong apoplectic fit, or like as in a rupture of the heart. The sweating sickness, in 1517, commonly killed in three hours; and the same epidemic disease revisiting this country in 1528 for the fifth time, (erroneously stated by Friend as the fourth time,) proved mortal in the space of six hours. The black death killed within three days, or five, from the first seizure. In the plague of Athens, the distemper commonly ran out to the seventh or ninth day, which were the most usual for mortality. In the plague of London, which continued at intervals for two years, although it occasionally killed instantaneously, the more fatal

day was the second or third. From all which we gather that special epidemical poisons, like special poisons in general, kill in modes and within spaces of time conformably to special laws.

106. "The atmosphere of organic matter thrown off insensibly by every population, more or less dense as a district may be more or less open or close, and rendered more poisonous by the exhalation from common sewers, church-yards, vaults, slaughter-houses, cesspools, factories, all commingling therein," may be sufficient to impress destructive force on the living, so as to receive and impart the processes of re-action in the zymotic principles necessary to the spread of typhus fever; but it is insufficient to develop epidemic disease, unless aided by that epidemic influence to which all progressive epidemics have been traced.

107. In many zymotic diseases, and in diseases induced by specific poisons, like small-pox, when Nature is shaping her method of cure by determining the fluids from the periphery to the centre, it may be dangerous to attempt an opposite method, by diverting them from the centre to the periphery: but in Asiatic cholera, in which the relaxation seems rather to be the result of the poison on the nerves, depriving the tissues of their containing power, it seems more rational to refer the extraordinary evacuations to a force allied in its nature to that of tobacco, such evacuation not being instituted or set up in the

system for curative purposes; but being the direct effect of the poisonous impression, and to be obviated like those of tobacco, or of hydrocyanic acid, by the judicious adaptation of powerful stimulants. The proof of this absence of containing power in the tissues is to be found in the fact, that if gallons of saline solutions are injected into a vein in the arm, the foreign fluid so introduced escapes by the stomach or the bowels; nor can the physician recognise Nature's attempt to get the better of the poisonous impression, until she has established something like fever, the intense thirst being referable to the loss of serum, and allied to that experienced by persons applying themselves to exhausting labour, not being so accustomed; in which latter case let the labour be intermitted and the exhaustion be relieved, and the thirst ceases simultaneously.

108. The sepulchral voice noticed in cholera is the result of extreme inanition, and occurs, among other diseases, in diabetes, and also in famished communities, among persons of the middle age of life.

109. The cloud of organic matter exhaled from man and beast, and from all the receptacles for filth, will differ in property or quality, or mischievous strength, according to the degree in which it commingles with the natural atmosphere which it pollutes. According to its quality or sort, it attracts or developes myriads of insects; each sort, attracting or developing insects

of a particular species, as noticeable by every person. When this process is invisible to our grosser senses, except by a gloominess in the atmosphere, it is called a blight; and such a blight under a new meteoric or epidemic force is the most probable conjecture of the real nature of a progressive epidemic force, since the electrician by passing a current of electric fluid through certain minerals has observed them gradually to be covered with insects under such force. But this is merely a conjecture.

110. Some substances prove poisonous only to one person in a hundred; some to one in a thousand, or one in ten thousand, as the hay-atmosphere for an example among many others; and contra, it is quite possible that an epidemical atmosphere injurious to the many may be salubrious to the few.

111. A disposition or condition of the atmosphere bringing in disease indigenous to our climate is frequent and common; but by the clemency of the Deity, such a pestilential condition as may suffice to induce destructive pest occurs rarely, and although the exact nature of it may serve to exercise human ingenuity and conjecture, all such knowledge still remains conjectural.

112. In the plague of London, and in all epidemics, some have been observed to be affected so slightly as still to pursue their ordinary occupations, disregarding as well prevention as cure.

113. A new and extraordinary epidemic force brings all things under it, and sways the character of all acute diseases, so long as such force prevails. Thus a woman dying in child-bed may have presented some traces of cholera. A man stabbed may die with symptoms of cholera. Some may die of prevailing inflammations, yet showing signs of cholera. A case of poisoning may receive the impress of cholera; and persons under typhus may have the symptoms of that malady commingled with those of cholera. Even the intelligent of the public, ignorant of this law, are apt to deride us for calling every thing cholera, when we have merely described this last link of a chain, this crowning impress of epidemic force.

114. As there is one glory of the sun, another of the moon, and another of the stars, so in producing disease there is one malignant power of the upper air, another in the more immediate circumambient air, charged with a cloud of animal and other exhalations, another of the earth, another of the waters on and under the earth, and another existing or generated in man's own body; these powers concurring, or not concurring, and in the degree of concurrence, determine man's danger or safety.

115. Naturalised epidemics have their rise, their climax, and their declension; but an exotic or new epidemic often exerts the greatest force, and is most rapidly fatal, at its outbreak; thus former exotics

have rapidly destroyed life at their first appearance, limiting their course of disease to a few hours, or killing instantaneously; but after a few months their force has lessened, so as to give time for the usual development of fever in its usual course.

116. The average visitations of new fatal exotics have been calculated as recurring at each revolution of forty years, and there is none on record which has been in this country less fatal than Asiatic cholera. After the first appearance of an exotic epidemic, failing of naturalization, it has a tendency to repeat its visit once in each revolution of sixteen years. Thus the sweating sickness, which was said to have been brought over along with the army of Richmond, afterwards Henry VII., first appeared at Milford Haven in the year 1483, when, meeting with no apt epidemical condition, it soon disappeared. It repeated its visitation under epidemic influence in 1485; and it re-appeared altogether five times, with an average interspace of sixteen years; not until its fourth visitation reaching the court, and proving mortal to many of the courtiers in six hours, Henry VIII. owing his emergence from a severe attack to the well-known vigour of his constitution. At its fifth and last return, or sixth visit, in 1551, it carried off 120 in a day within the precincts of Westminster alone, where the two sons of Charles Brandon, both Dukes of Suffolk, died of it,— $1551 - 1485 = 66 \div 4 = 16\frac{1}{2}$,—which agrees with the interspace between the two visits of Asiatic cholera.

117. In the capricious visits of an exotic, as in sweating sickness, the earlier visitations may prove fatal to the poor: in the later the poor shall escape altogether, and the highest classes shall be the victims. Thus in the three first visits of the sweating sickness the rich escaped; in the fourth they began to suffer; in the fifth severely; and in the sixth extensively and exclusively, the poor escaping universally. So in our own time, this capricious character of new epidemics is still preserved. The Irish typhus, a new epidemic, which first appeared in 1816, was for many years limited to the poor; but in the progression of its unhappy naturalization, it has found its way to the upper classes, and when contagiously introduced among their families, it is growing proportionably more fatal to them than to the poor themselves.*

118. As in common poisons some, as for example tobacco, hydrocyanic acid, foxglove, or the ancient State poison of Athens, subdue and relinquish the powers of life without exciting reaction; others equally fatal excite violent inflammatory reaction and excessive heat; as corrosive sublimate, arsenic, cantharides; so it is with atmospheric poison developed by epidemical forces, some are remarkable for their relaxing and prostrating effects on the nerves and

* The mortality (according to a Government report) has been much greater among the higher ranks of society whom the disease has attacked, than in the labouring classes; and the physicians and other attendants, as well as the clergy, have felt its destructive force in much more than an ordinary proportion.

tissues, as Asiatic cholera, others for rapidly developing violent, active, and destructive inflammations, as plague; and some forces also, like common poisons, produce mixed effects, as that of violent influenza.

119. Reference to the registry of disease all over the world, just as special reference to the registry of disease in Great Britain, and to our army and navy medical returns from all our possessions, will show that bowel flux when epidemic arrests catarrh; and vice versa, the number of cases of catarrh will gradually ascend in an exact ratio with the descent of bowel flux. In all epidemics, ordinary and extraordinary, naturalized and exotic, in proportion as the forces relax the bowels, they will manifest less energetic action on the skin and on the air passages; not excepting the poisonous epidemic forces of small-pox, for this last has at one time manifested its influence by inducing all ordinary febrile symptoms, except the eruption, for which in 1668 a diarrhœa or spontaneous salivation was substituted. This explains why, in Asiatic cholera and its ally epidemic diarrhœa, the fever of reaction is languid and indistinct.

120. A new epidemic may show itself repeatedly without becoming the master-epidemic. We call that the dominant epidemic which avails to place its impress on all other diseases, just as, if five or six poisons be administered at once, the effects of some one will probably be predominant over all the rest;

or equally when a compound of five or six active remedies is exhibited. We call a disease zymotic, or of leaven, or a fermenting disease, when a particle of tainted effluvium, in any way introduced into the circulation, excites a ferment in the blood, just as barm excites a ferment in a body of dough, or in a bulk of saccharine fluid.

121. To ascribe to electrical effects an attack of Asiatic cholera on the score of the suddenness of such attack, is as irrational as for a man to say that, of two bottles of wine, the last glass made him tipsy; or that the last dose of mercury salivated him; or that the last dose of foxglove or of nightshade caused vertigo; because the operation of the epidemic force is to the physician's eye often manifest in the countenance of the patient for one, and sometimes two or three days, before the sufferer himself suspects his misfortune; and farther, it has been observed, that for some time before the visitation of Asiatic cholera, where blood has been drawn for other diseases, the gradual impress of epidemic constitution has been manifest by a tar-like appearance, alien to the ordinary character of blood in such diseases, and "uniform in such character, whether drawn from the most delicate female, or from the most robust and healthy soldier." Epidemical writers have all left on record proofs of new epidemical conditions, taking their initiation by modifying other diseases before each becomes confirmed and develops that which is proper to itself.

122. When fatal epidemics break out in well trained, regularly disciplined, well fed, and comfortably clothed armies, and also in the disciplined crews of ships communicating with the shore, the camp followers among the former, and the loose bumboat sutlers, pedlars, and prostitutes, hanging about such ships and having intercourse with the crews, will ordinarily be found first to have suffered ; and, in the sequel, the officers; which last will exhibit the greatest mortality in proportion to the number of cases. The “greater prosperity, affluence, and civilization of the higher classes do not blunt the arrows of epidemic disease ;” but the vantage ground of life enables the rich more frequently to avoid them, just as it enables them to avoid many other damaging forces leading to other diseases. But their powers of endurance, and of conflict, and of antagonization against conjunct epidemic forces, when such forces have once lighted upon them is, compared with that of the poor, as ~~4 to 3~~. This is ~~3 to 4~~ the true explanation of that greater longevity of the rich, which has been established by a philosophic contemporary. Whenever, in the consummation of causes, certain forces known to be more damaging to highly susceptible bodies chance, under the controlling power of epidemic influence, to acquire a greater determining value than those collateral forces to which the poor are more commonly exposed—then the rich, because the more susceptible, and women, because the more susceptible, and children, because the more susceptible, will suffer

the most; but under any circumstances the relative mortality in proportion to the number of cases will be greater among the rich than among the poor, taken in the aggregate. This is not an opinion, not a theory; but a broad, incontrovertible, and intelligible fact, proved by the history of epidemics throughout the world. The determination of the character of the combined forces mainly depends on that of the epidemic force; the quality, like the intensity, of which is not permanent, but varying in transition under the lapse of years. The different effects of noxious drinks and poisons upon the most susceptible and the least susceptible, serve as an illustration of this law. There are some poisons which are tolerated more easily by the susceptible, and even by the delicate frames of children; but these are only exceptions to a general law.

123. Under the force of all epidemical poisons, equally as under the force of malarial, miasmatic, mephitic; under that of intense cold, intense heat, of horror from fright, and other mental emotions, of sudden grief, of poisons of all sorts, if introduced into the blood in quantities short of producing instant death, whether animal, vegetable, mineral, or mechanical, as in accidental violence and in severe surgical operations; in short, under the force of damaging impressions of all kinds, the cold stage, as it is called, or stage in which the blood quits the surface and retreats towards its citadel the

heart, driven from the periphery by that same spasm of the muscular coat of the capillaries, and other smaller vessels, which is often the forerunner of spasm in coarser and bolder muscular structure;—THE GREATER AND MORE COMPLEX THE FORCE, and the less the individual power or vigour to resist it, the more protracted will be the stage of cold prostration. Hence tetanus from cold; hence lockjaw from a wound; hence tetanus from internal causes; hence tetanus from fright with a burn after catching fire; hence tetanus or spasms in or after painful delivery; hence an ague-fit from the knife; hence spasms in hydrophobia; hence spasms in severe and dangerous English cholera; hence spasms in Asiatic cholera; hence spasms in stumps after amputations; hence chorea sancti viti after fright; the spasms in nearly all these cases being preceded by reduced temperature, but not necessarily so connected, and sometimes independent of it, and in all instances to be easily traced to the damaging force. Such violent spasms do not necessarily follow as an effect of the damaging force, but accrue, or not, according to the previous condition of the recipient, and according to the character and intensity of the conjunct forces. The same law may be traced throughout poisons, and these may be made to produce on animals prostration merely, or cold prostration with diarrhœa, or cold prostration with or without rigours, or with or without fatal spasmodic cramps, at the pleasure of the experimentalist.

124. As all poisonous forces produce cold prostration as their most familiar effect, until Nature's reaction takes place, so such cold prostration will be more or less protracted, more or less dangerous, according to the intensity of the force, and according to the degree of vigour for resistance, while the languor of reaction will be in a ratio with the intensity of the force, and in an inverse ratio with the degree of resistile vigour.

125. Murrain among animals sometimes occurs during human pestilence, but more frequently the two own no connexion, for man holds his vitality under laws widely differing from those under which animals enjoy the tenure. Some poisons alike destroy men and animals; again, some, harmless to animals, rapidly destroy men; and the converse is equally true. Sheep-small-pox and cow-pox have lately been prevalent in Essex, and the former very fatal; yet, with the exception of here and there a shepherd, who had had a few pustules from local contact of the matter with an abraded surface; the germane disease, small-pox, has not been unusually frequent in their district. Certain experiments on this subject, the author, when lately in Essex, left for verification in the hands of an extensive land-cultivator, Mr. Scratton, of Milton Hall, and the medical gentlemen of the neighbourhood.

PART II.

P R E V E N T I O N.

1. For the prevention of malady, diet and exercise have ever been more efficacious than medicine, and in many cases even in the cure of disease: FOR THE BEST MEDICINE IS GOOD FOOD AND DRINK, SEASONABLY ALTERNATED WITH SEASONABLE ABSTINENCE: yet there are few minds, even among the well educated, that do not rather cling to the more renowned mysteries of physic, on which preferably to ground their hope of relief. Such is the nature of man, ever credulous, and awed by that which he cannot comprehend, superbly insolent in his estimation of truths with which he is daily familiar, and holding cheap as well the means of health as the health-giver, so soon as the veil of mystery is removed. The Empirics of old contended that, as we cannot prevent accidents from wounds, or cure them when mortal, so neither can we prevent the mortal force of epidemics; and to a certain extent they were right: for when once a mortal wound is inflicted, or a mortal blow of an epidemic is inflicted, all remedies will prove abortive.

Yet a blow of either kind may prove mortal to a constitution in an unfavourable state to receive it, from which one placed under more favourable circumstances might happily emerge. The wealthy of this country in this particular are not equal to the ancients, for they had their *Jatralipts* or trainers, whose business it was by diet and exercises to increase their energy and vigour for all necessary occasions. A lowering of natural energy exposes the body to epidemical influence, while whatever permanently sustains such energy tends to fortify the system against attack: and hereby is not meant that artificial energy procurable by stimulants, transitory, and always followed by a corresponding debility, but the energy of increased health. It is incumbent on the writer who lays down such a precept for public precaution, to indicate the means by which it is to be carried out, and to take care that these be simple and within universal, or at least general, reach.

2. First, then, of his habitation: whether large or small, it ought to be kept clean and dry; and all drains, cess-pools, and receptacles of filth on or near his premises should undergo careful scrutiny and lustration, especially when these are rendered suspicious by the presence of odorous exhalations. His windows should be occasionally left open in fine weather, and frequently cleaned, in order more freely to admit the light, alike essential to animals and vegetables, except to those who love darkness rather

than light, that first sublime work and free gift of the Deity. Old and dirty walls should be frequently whitewashed, and old wainscotting such as we find in the over-crowded rents in London,—though now the least wholesome, yet once the habitations of the wealthy,—should be well dry-rubbed. During rainy and damp weather fuel should be used more freely, bed and other linen should be changed more frequently, and the body should be invigorated by more repeated washings, not only of the head, hands, and feet, but of the arm-pits, breast, and groins; and during the washing, or immediately afterwards, the back of the throat should be well gargled with cold water, a small quantity of which may also be swallowed at the night and morning ablution. And again the author must record his tribute of admiration to former statesmen, who imposed, and to the present, who retain, the impost upon soap, since it insures the poor man's appreciation of the blessing, it being an article of which statesmen stand in less need. For small, confined, and badly ventilated houses a perforated zinc pane-ventilator, the cost of which is only two or three shillings, may be inserted in one of the windows, a square iron tube, measuring from two to four inches in diameter, being inserted into the breast of the chimney, to carry off the vitiated air. This should be guarded at its orifice facing the room, with fine wire work, at the back part of which a piece of oiled silk should be allowed to hang as a valve, to allow the vitiated air to pass up the chimney, and to prevent the smoke from entering the room. With

regard to disinfectants for the effluvia of jail or typhus fever, English evidence is chiefly in favour of the gas given off by pouring about an ounce of oil of vitriol upon a handful of saltpetre, heated in a flower-pot saucer over a hot brick. But this or chlorine fumigation could only be demanded in an atmosphere rendered suspicious by bad smells; and as regards cholera when actually existing, experience has shown that it exerts no power to arrest its progress among the fellow-lodgers, while the process itself may be injurious to the patients already afflicted. The refreshing odour of any of our aromatics, as, for example, the burning of a bunch of lavender or the sprinkling of spirits of juniper, has been recommended in preference. The apartments should be rendered in all respects as cheerful as circumstances will admit; neatness, with cleanliness and comfort, being known to impart through the mind a healthy impulse to the body. A genial temperature ought to be preserved as well in the sitting as in the sleeping apartments, the first by fuel, and the second by comfortable bed-clothing.

3. During the prevalence of an epidemic, those who have it in their power should give a decided impulse to their minds by taking short tours into the most healthy parts of the country, using carriage exercise, or exercise on horseback; and, if in summer, they should occasionally enjoy an excursion by sea. But, whether as regards the rich, or the middle classes, or the poor, all should set apart certain

time for recreation and cheerful walks, holidays spent in innocent amusements being a powerful means for refection of human energies, provided due care be taken to avoid exposure to extremes of temperature, with regard to which there can be no better precept than that which tells us to keep the head cool, the feet warm.

4. Sound religion exerts a preventive force against all diseases ; gloomy enthusiasm promotes disease.

5. Excessive fatigue, whether from forced labour of mind or of body—our national fault or state misfortune—indigestion, surfeit, excessive cold or heat, and debauch of every kind, are all to be guarded against, and especially by the delicate. Rising at unwonted hours, sitting up late, neglect of clothing, and long fasting, are, during a sickly season, all pernicious ; while abstinence increases the security of those who are too full ; increased frequency of meals should be avoided ; moderate and generous diet fortifies the body, for good food is one of the best safeguards, provided it be occasionally alternated with seasonable abstinence. But as regards individual habits of food known to agree with the individual, the less change the better. Those who habitually drink wine, spirits, or fermented liquors moderately, would do well to take these weaker on alternate days, as a means of giving healthy elasticity to the body. Those who have been unavoidably

exhausted should take nothing but what is light and easy of digestion.

6. Refreshing exercise is a prime means of increasing vigour; and this ought always to precede a meal, even with those artizans who are industriously engaged in manual labour of any kind: for the habit of suspending labour, and eating a hurried meal while in harness, is neither good for man nor for beast: getting out of harness, though but for half an hour, equally refreshes both. Manly games should be encouraged short of fatigue; fruit and wholesome vegetables in moderation are rather beneficial than otherwise.

7. One Roman sentence embodies nearly all that is useful for the prevention of pestilence. "Cold, excessive heat, satiety, long fasting, exhaustion, debauch, vomiting, purging, are all bad; increased repose of mind and body, that is to say, moral and physical tranquillity, are good for all persons;" for cheerfulness quickens the secretions, promotes digestion, and increases the vitality of the blood; extreme or protracted anxiety poisons the secretions, poisons the blood, as shown by the state of the breath: and such diminution of vitality lessens man's power to antagonize epidemical force. With regard to preventive medicines, our countryman, Dr. Heberden,—as also the best authority on cholera, Mr. Annesley,—as also a whole nation, the Dutch, who

are particularly exposed to malarial influence, all advocate warm bitters, taken in cordial doses; and the two above-named eminent authorities give the preference to Peruvian bark or its salt, the sulphate of quinine, exhibited in any cordial vehicle, such as the tincture of orange peel, proposed by Sir Henry Hallford, or orange wine, as proposed by the author, or, for colder or more fastidious stomachs, curagoa, or for the poor, half an ounce of bark and a broken penny nutmeg, macerated in half a pint of genuine French wine-brandy, and taken in the dose of a tablespoonful every morning an hour before dinner. The cheerful tranquillity or mental repose recommended by ancients and moderns, that salt on the sparrow's tail, is not so easily supplied. Its dispensers must be looked for among the wealthier, who by attending to their part of public prevention will cultivate a source of cheerfulness as well in themselves as in others, since charity, like mercy, is twice blest: it blesses him that gives and him that takes it.

8. Life being a process of animal combustion in which vitality is the flame and our food the fuel, we must take care to keep up a brisk, cheerful fire. If we fill the grate at once with a large heap of choking fuel, we damp the flame, and sometimes put it out. But if we occasionally stir, blow, and encourage the process, life, like the domestic hearth, will be all the more cheerful for it. Those who overwhelm their stomachs with food, and ladies who go to bed oppressed with a supper which they

cannot digest, are all like smothered fires; especially those who descend from their bed-rooms stupid, inanimate, lackadaisical, and taking their seats at a breakfast-table only to get thoroughly awake by the refreshing beverage, tea, apparently ignorant that the free supply of air is as essential to active vitality as to active combustion, and that the degree of energy of innutrition, (as I had the honour first to indicate in the medical supplementary statistics to Sir John Ross's "Voyage to the Arctic," years before Liebig wrote on that subject,) determines the quantity of caloric eliminated in the human body, equally as it determined the activity of the circulation. The inspiring appeal of the Roman poet, who advised his friends to lay more fuel on the hearth and to live generously, applies to the process of human intracombustion also. The ode which contains the precept is, to the philosopher, worth all the bulletins of the Board of Health.

PART III.

A I D S.

1. There is no point in professional duty wherein the dictates of virtue, and worldly prudence, are so identified, as in this great question of resistance, by violent remedial forces, to the established force of epidemic poisons. Success, it has been invidiously remarked, constitutes, in most instances, the sole difference between him who kills and him who cures his patient. A rational probability of success, it may be truly said, distinguishes the well-considered scheme of the philosophic physician from the rash and blind enterprise of the empirical disturber of the commonwealth of the human body, already afflicted and embarrassed under the influence of disease. To command success is not in the power of man; but to deserve success, by choosing a proper time, as well as a proper object of cure, by the prudence of his means, no less than by the clearness of his views, by remedies not only intrinsically good, but likely to insure general consent, is the indispensable duty of him who presumes to meddle

in the formidable insurrection of nature's powers, rising against, and in conflict with, epidemic poison. In this awful particular, we ought at least to be assured of very probable grounds of belief that the forces which we employ are sufficient to carry us safely out in our undertaking; otherwise we are not only guilty of accelerating death, but also of holding up the same degree of guilt, to invite the imitation of all those who may be induced to become our practical disciples; a crime which may escape the subtlety of law, but which cannot escape the eye of God, and can only be palliated by the plea of invincible ignorance. The empirical and blind exhibition of remedies, even when apparently successful, often owes such doubtful character to the difficulty of deciding between escape and cure; becoming in the sequel a permanent curse; while sound practice, conformable to the laws of nature, and founded on the rock of ages, though less captivating with the ignorant multitude, can only be susceptible of improvement in proportion as the knowledge of those laws shall be further advanced, continuing useful to the remotest posterity, and almost as advantageous to future generations as to the age on which the blessing was first conferred.

2. The laws of causes and effects being duly understood so far as they are at present intelligible, and due value being given to each singly, and to all combined, it is the physician's duty to observe which of them are chiefly co-operating, and in what degree they

have already inflicted damage: for such considerations alone will render his duty simple, manifest, and free from hesitation. In that path he will proceed without admiring, despising, or fearing anything, since, under God, he has no superior in the great task of lessening human suffering—that God-like vocation selected by our Saviour himself during his sojourn with mankind, wherein to hold up to mankind in all after-ages the striking contrast between Divine power and human infirmity.

3. The best authors, the leading master-spirits of the healing art of the sixteenth and seventeenth centuries, ever memorable for epidemics, have generally affirmed that bleeding before and at the invasion, is the best safeguard against all pestilence; and among other striking illustrations of its prophylactic powers, they have recorded, that whole armies have been bled standing in the field; and that in our own camp in Dunster, out of the numerous army so blooded not one afterwards sickened, although the plague was in the camp. But all these writers agree in their account, that the blood in the epidemics of those days was inflammatory blood, buffed, as it is called, showing on its surface a thick covering, like dirty, coagulated white of egg, or like dry gelatine, as in the blood of pleuritics. It is gratifying to the philosophic mind to contemplate the accordance of modern discoveries with the pathological observations of our illustrious predecessors; for, divested of all theory, we now know that in certain inflammations

the strong and main link of the disease is the excess of fibrine in the blood, and that bleeding, by diminishing it, either breaks the chain of cause and effect, or mitigates the disease. The above-named philosophers confidently asserted the fact, without possessing the philosophic explanation; and it was well known that as blood-letting would guard against, mitigate, or entirely prevent inflammation, so the same remedy would mitigate the inflammatory small-pox, and many other epidemic diseases, which, from their nature, cannot be arrested in their natural course. But Asiatic cholera develops no such characteristic inflammatory signs in the blood, but one much more alarming, its spontaneous separation or dissolution of copartnership between its vital breath, called in Hebrew, the voice of the blood, its serum, or watery portion, and its more solid or crasser part; which dissolution was emphatically called by John Hunter, the death of the blood. Hence it is plain that bleeding cannot be admitted as a general preventive, while there may be constitutions oppressed with general plethora, or redundancy of blood, or with such plethora or redundancy in one or more organs, as might render bleeding a sound preventive or palliative, even with regard to cholera—a discrimination to be made only by the physician; for the taking away of surplus blood increases the animal spirits, imparts a feeling of lightness and increased activity, and by thus increasing health and vigour fortifies the human body. That some epidemic poisons should inflame

the blood, and others render it poor in vitality and flabby in its texture, is no more surprising than that spirits, or high living, should produce inflammation; or that damp or foul air, and vitiated food, should produce scurvy; or that a whole class of poisons should be remarkable for giving a tendency to the increase of the fibrine of the blood, while another class is known uniformly to exert an opposite effect, breaking down the structure of its globules, and lowering, or in an instant destroying, its vitality. Should the profound thinker object that some poisons either produce inflammation or corruption of the blood, according to the dose in which they are taken, let him also reflect that the same law also applies to small-pox, simple or confluent, to typhus, inflammatory or putrid, just according to the degree of force, the collateral circumstances, and the degree of healthy resistile power offered by the human body. In the public services, where there is a frequent mustering of men, and where the eagle eye of the physician can at a glance detect, as has already been stated, the presence of choleric or other epidemical force in the earliest stage of the disease, sometimes before the sufferer himself suspects it, and while as yet the circulation is well sustained at the wrist, bleeding to the extent of from sixteen to twenty ounces, has been asserted to prove successful in nine cases out of ten, other auxiliaries not neglected; but in civil practice the use of this valuable remedy requires more caution, nay, it has been acknowledged by this same authority to whom we are indebted for the best

practical information that, as a rule, bleeding in a later stage is followed by death, though he has sometimes seen the balance of the circulation restored and the patient recover—these being only exceptions to the rule. And yet, with these facts before him, recorded by himself, insisted upon by himself, he recommends bleeding in every stage. It is our business to clear a way through this intricacy.

4. Under the damaging forces of blows on the head, of agues in the cold stage, did we but know that such forces were about to be inflicted, the moderate abstraction of blood would place many in a more safe position for the reception of such forces, by giving more elasticity to the powers of nature, and by lessening the chance of fatal congestion; and this is all that bleeding can do for Asiatic cholera. Nay, even this in civil practice ought not to be attempted when the pulse fails, or where the physician has had no satisfactory foreknowledge of the existence of adequate powers in his patient; and the same has always applied, and has been generally well understood, as regards bleeding in the cold stages of ague. In our army and navy, well fed and well clothed, systematically trained for health and for vigour, the early abstraction of a pint of blood is a rational lightening of vessels, to prepare them for the conflict; while the same practice among the poor, the depressed, the over-worked, and the half-starved, would but accelerate dissolution, and could have no rational object, since Asiatic cholera is not inflam-

mation, and the removal of surplus blood, not deficit blood, avails to give relief, and the object of bleeding is to take off from Nature a surplus burden, to enable her, with the rest of her blood, to oppose the damaging force more successfully.

5. When a man has concussion, or the cold stage of an ague, and the failure of the circulation and the desertion of the blood from the surface greatly alarms us, we all know that external warmth, and internal, hot, cordial stimulants may make all the difference between life and death; opium, with aromatics, is a grand cordial; brandy is a cordial; all aromatics are more or less cordial; sal volatile is a very eligible cordial, for, whether as regards the relief it affords in narcosis from tobacco, or in the relaxing prostration of Asiatic cholera, it has been proved, not in the experience of one man, or of one country, but in that of a great part of the world, to be a most efficacious diffusible stimulant. But as no experienced surgical physician should give opium in concussion of the brain under any circumstances during collapse, so no physician would administer it as a narcotic in Asiatic cholera; while its administration, combined with aromatics, as a cordial in epidemical diseases, is as old as sound English medicine, and was Sydenham's grand means for supporting the powers of life, for recruiting vigour to enable them to battle it out in the conflict, and for directing the fluids from the centre to the circumference, whenever an injurious diarrhœa was

recognisable in malignant disease. The lovers of the classics all know that the nepenthe of Helen was *prepared* before it became a cordial to Telemachus. Let those who would still insist on narcotic doses of opium to relieve the spasms of Asiatic cholera, first tell us whether they have ever relieved the spasms of tetanus, or the spasms of hydrophobia, by the same remedy, no matter how extensive the dose.

6. The experiments of certain illustrious physiologists on animals, have shown us that when apparent death, or a state just short of death, shall have been produced by tobacco or hydrocyanic acid and other poisons, if the circulation and breathing be artificially maintained, perfect recovery may ensue. The author of this work has satisfied himself by multiple experiments on animals, that the same condition, nearly allied to death, may be converted into complete recovery by the administration of cordial stimulants, as it is in the power of all persons to ^{*}verify by repeating the like experiments, the poisonous forces being so employed as barely to produce the effect. The same law is recognisable in the treatment of disease, for many have recovered by the patient, judicious, and assiduous use of cordial nutriment even after the physician has given up all hope. This great truth was inculcated by the fathers of medicine in the following aphorism: "The last hope in formidable diseases is that the disease may be protracted, that the patient may escape by the morbid action wearing itself out

under a judicious support of the powers of life during the conflict."

7. Active and continued friction with stimulating liniments of all sorts have not only been recommended by modern medical authorities wherever this new disease has appeared, but until very lately, even under the sanction of Governments. A most mischievous error, betraying a total ignorance of the effects of friction as a remedy, and abandoned only after thirty years' experience of its injurious effects. This error, which has been so long epidemical amongst us, has been committed throughout the world, with the precautionary APHORISM of the great Father of Medicine staring us in the face: "Friction for all acute diseases is decidedly bad, for it exhausts." This is a striking example of modern presumption, and of the mischievous results accruing from the neglect of authority. It is curious and interesting to observe that in recording this opinion, and in his criticism upon the opinions of Asclepiades, the Roman physician has observed, "Let us not defraud the moderns of any new inventions, or of the merit of rightly carrying them out: neither let us deprive the ancients of such discoveries as they are entitled to." In that same criticism he points out that it is the tediousness and exhausting effects which render friction so objectionable, except in phrenetics, in whom it may induce sleep. Heated air introduced into the surface of the body previously covered with long flannel gowns close from

the neck, and exceeding the stature of the body by at least two feet—if these gowns be sprinkled on their internal surface by cowhage, as proposed and published by the author many years ago—will answer every useful purpose, though blisters and mustard poultices to the calves and feet may be very useful auxiliaries.

8. Calomel appears conspicuous as a remedy for cholera from the reports of Corbyn in 1819; and throughout the medical literature of the first quarter of a century afterwards, it was asserted to be the chief remedy. But experience has proved that it is wholly inapplicable until the conflict has already ended in a qualified victory; and if a just and prudent reference to the experience of our best epidemical writers, and all analogy with the effects of other poisons, had had their due weight, nothing but mischief could have been expected from it. It is when the conflict has passed that calomel in full bile-forcing doses becomes useful by disgorging the biliary vessels, and by detaching the viscid matter adhering to the inner surface of the bowels. This unqualified condemnation is not intended to apply to the use of small doses of calomel and opium to arrest a protracted or suspicious diarrhœa, which might lead to an invasion.

9. The hot water or vapour bath, in which we have so long been blundering and floundering with our patients, has been abandoned after years of experience, the shame of which one minute's reference to the Greeks and

Romans might have saved us: "During a pestilence the hot bath is dangerous," says Celsus upon Hippocrates. Thus nations as well as individuals will own no master but their own experience, and that master at the expense of the lives of their fellow creatures.

10. The intense thirst, which has been a character in most fatal epidemics, has ever been met in all ages by the free use of cooling, acidulated drinks grateful to the palate; and even "well-hopped small beer," says Sydenham, "is not to be denied, but rather to be recommended in all fevers, even dysenteric fever not excepted." The extreme loathing and disgust of all warm fluids on the part of the patient should induce us, without there be manifest objection, to consult the patient's palate; and the same says Heberden and many more eminent authors. Nitric acid lemonade, tartaric acid lemonade, weak cold gin punch, have all been used without apparent detriment, and generally with manifest comfort to the patient. Neither can any reason be assigned why the ammoniacal saline draught, guarded by syrup of poppies, and flavoured with tincture of orange peel, should not be allowed in Asiatic cholera, as well as in any other epidemic, for although a single draught of any of these simple remedies must be unimportant, the aggregate effect of a number of comforting impressions on a large tract of surface must contribute to the economizing of the vital powers, and to the recruiting of vigour. Nor is this at all inconsistent with our pre-

vious or subsequent use of cordial warm draughts exhibited hot, for these, if they do not succeed within the first two hours in producing sweat; either do not succeed at all, or are more likely to succeed by such gratification; it being notorious that in a body, inclusive of the head down to the eyes, well covered, a draught of cold water often acts as a diaphoretic. It was well known to Sydenham that a state of vomiting, and of loathing of medicines and tepid drinks in epidemics, was best removed by the free allowance of gratifying drinks; and he permitted, even in the plague of London, the free use of cold sage tea, or of small beer flavoured with mace, or any other aromatic to the palate, for the first four and twenty hours; for he emphatically tells us that while that loathing remains, it is a bar to the use of medicine. It was not till after the first four and twenty hours that he exhibited the same drinks with the chill off. He gives another very useful hint alternately to render such drinks slightly nutritious, as well as refreshing. Cold barley water, flavoured with rose water and acidulated with orange or lemon juice, and sweetened with syrup of poppies, seems well adapted to such an end. The same barley water, or a clear infusion of oatmeal, acidulated with sulphuric acid, and in like manner very slightly sweetened with syrup of poppies, forms a refreshing drink, as likewise does toast and water itself, or any of the same drinks, acidulated with tartaric acid, and flavoured to the palate of the patient. Neither is there any good reason why the patient

should be denied any simple drinks for which he may express a fancy; cold water, with a dash of milk in it, not excepted. The ancients, in fevers at once requiring free use of cold potations and nutriments also, used a sort of cream, as they called it, expressed from macerated corn or rice, a quantity of which diffused through cold water they allowed the patients to drink to satiety. This was an anticipation of the starch and gum drinks of the moderns, for although they had no knowledge of the intimate structure of mucous membrane, or of skin, they too had their fanciful ideas of arresting flux or exosmosis by smearing both. It is curious to observe that, while Annesley urges the great utility of lemonade and tartaric acid drinks, and calomel in full doses, with certain bitters, the *drogue amère*, on the ground that these acids as well as the calomel have the power of dissolving a peculiar viscid, tenacious, cream-coloured secretion, accumulating in the intestinal tube after the conflict, and sometimes not only filling it, but glueing it together so as to render it impervious, other bold originators proposed the exhibition of thick, insoluble matter, with the intention of smearing the internal surface of the bowels to arrest the serous flux. Certain it is, that in recovery from cholera, much of this material is voided—altered into black or grey dejections—by the chemical action of the calomel passing over its surface, and that calomel produces the same chemical reaction upon any portion of this cream-coloured matter taken from the bowels after

death. It is equally certain that a dysentery has been suddenly arrested by the patient swallowing some ounces of melted fat which had been removed from mutton broth, and brought up to his room by mistake. If the separation of this secretion is intended by Nature to arrest further exudation by a law allied to that by which she stops a wounded vessel, we may understand how, under a moderate deposit of it, patients may recover, and how, when it fills up the whole tube, and glues it together, her effort, like many of her efforts in other diseases, may prove abortive; but looking to the deposits, fibrinous and gelatinous, left after death in the cavities of the heart and large vessels, we are rather led to ascribe the appearances to exhausted vitality.

11. In the last visitation of cholera in 1832, certain physicians disputed the palm of having introduced mustard emetics to restore the fluids to the surface. This is one of the oldest remedies in English practice to bring on the hot stage in the cold stage of ague: and was also recommended by the Greeks and Romans, who for that purpose administered both mustard and pepper diffused through a weak solution of common salt. Nearly all writers upon epidemics have agreed that it is only at the approach of an invasion that an emetic can be given with advantage both to restore heat and check looseness of bowels; and that such a remedy, when the debility becomes extreme, is doubtful and dangerous. Our own experience of Asiatic cholera confirms their opinion.

He who knows how to treat a common English cold or Influenza, and we all pretend to know this, from the noble to the peasant, knows how to treat Asiatic cholera also, with equal success, when these diseases light upon the body with equal force. Attacked with chills, uncomfortable sensations, fulness of his head, unusual stupidity, cold creeping on the skin, and feeling his body shrunk and diminished in volume, and his spirits depressed, the Englishman towards evening pronounces himself fit for nothing, and discovers that he has caught a cold. Like a wise man, he goes to bed between the blankets, he takes his sherry posset or white wine whey, if a delicate civilian; while the more robust will swallow his stiff tumbler of strong hot grog, with a teaspoonful of sal-volatile; the farmer, his heated quart of strong ale with a glass of spirit in it; the poor man, who can get none of these, his hot treacle posset. Thus each induces reaction from the centre to the circumference, and in a few hours, with the many, all urgent discomfort shall have passed away. But if the cold be more obstinate, then comes the doctor with his comforting cordial opiate diaphoretics, and his liquor-ammoniated-fever-mixture; his diluents; his leeches; his fomentations and his blisters, to relieve congestion; and after the first conflict of the chilly stage, his doses of calomel to cleanse the bowels, and clear away foul secretions. Asiatic cholera requires the same treatment; and as to vomiting and looseness, what physician does not know that an English cold may

light upon the alimentary canal, and excite sickness and looseness the most alarming? What physician is ignorant that, when colds and influenzas of a more violent character light with dangerous force, an early bleeding in the full and robust *at the approach*, and just before the invasion of the cold stage, will render them comparatively safe, and will accelerate death in the weak and aged? It may be true that Asiatic cholera may demand hot brandy and water preferably, and stronger and more prompt and more diffusible doses of diaphoretic cordials, as also of opiate cordials: so also do some agues in the cold stage, as was remarked by Lind, who introduced the practice of administering opium as a cordial with other diffusible stimulants, in the form of the ague draught, consisting of a drachm of sulphuric ether, from forty to sixty drops of laudanum, and a scruple of aromatic confection diffused in peppermint water.

12. To relieve the stagnant circulation, to determine the fluids to the surface of the body, to allay the commotion of the intestines, to comfort the whole system, and afterwards to elicit healthy secretions, are the rational indications as well in a dysentery as in Asiatic cholera. And they equally apply to nearly all suddenly destructive epidemics, for not one of which has any panacea ever been discovered or, it may be safely prophesied, ever will be; since when a poison is introduced into the blood, recovery will chiefly depend upon the dose, the force, and the resisting powers of each individual.

PART IV.

ASIATIC CHOLERA.

1. SYMPTOMS OF PROSTRATION UNDER THE PRIMARY FORCE OF THE EPIDEMIC POISON.

A new epidemic profluvial disease, first appearing in the East Indies in 1816-17, followed by languid fever in recovery; not directly contagious, but owning contagion as an auxiliary indirectly with other forces. In the stronger, after restlessness, anxious expression of countenance, and diarrhœa; in the weaker, or more exhausted, sudden tremblings, giddiness, weakness, and frequent expulsion of the fœcal contents of the intestines; in both, afterwards followed by vomiting of the last ingesta, uneasiness, oppression at the pit of the stomach often ardent, universal prostration, coldness of the surface, shrinking of the bulk of the body, spirits depressed; and if the patient is asked how he feels at this time, he generally answers "Very well;" but if pressed upon the subject, he acknowledges that he experiences feelings that he cannot distinctly describe. His spirits, however,

are low, and there is a clammy moisture sometimes on the skin, and the pulse, although occasionally full and strong, is like his respiration, evidently oppressed and labouring. It is not, however, that kind of pulse which will attract particular attention, unless we are upon the alert for this disease; but being prepared for such a visitation, it is impossible to mistake it, and if justified by the habit of the patient, bleeding at this moment will be attended with the happiest consequences. As the invading stage of the disease advances, the patient feels considerable nausea, and his bowels, which were already loose, and at first shall have discharged their contents, which present various appearances, according to the state of the digestive organs at the time of invasion, gradually throw off stools, losing the fœcal character. The patient now feels a greater degree of exhaustion and inability to make the least exertion. Cholicky pains are felt in the belly, but they often pass off, or *are often relieved by pressure*, and by the free evacuations which take place in this stage. The urine in this period of invasion is often in small quantity, and seldom voided; watery, as in the cold stage of a severe ague. Sometimes the disease is at once ushered in, without any premonitory symptoms, by sudden, and violent, and large expulsion of the intestinal contents, with exhaustion and prostration. In the pathological condition of this stage, we recognise by post mortem inspection, that the large venous trunks and viscera of the great cavities are gorged with a tar-like, carbonaceous, ropy, black blood.

2. SYMPTOMS OF THE CONFLICT.

The assiduous, watching the pulse, will find that it occasionally returns with an increased strength and fulness, and that it is sometimes sharp and hard, followed by a return of warmth of the extremities and an increase of heat on the surface of the trunk; the calls for drink are urgent, but less frequent and with less nausea; there is a diminution of the burning sensation, or oppression, in the epigastric or umbilical regions; the spasms, more frequently clonic, sometimes tonic, if any have appeared, return with more or less urgency, and gradually cease, as do also vomiting and purging. The tongue assumes the fur characteristic of fever. Perspiration is first seen on the forehead. If this amendment goes on, the conflict ends in the following signs of success.

3. SIGNS OF SUCCESSFUL CONFLICT.

The stools become browner, though watery; then dark, black, and pitchy. Total cessation of the spasms; gradual restoration of the pulse at from 80 to 94, with heat and languid fever; appearance of vitiated bile in the motions; frequent discharge of urine of higher specific gravity, and this the more favourable as it is loaded with a lateritious sediment; respiration gradually less laborious and more natural; pulmonary breath warmer; an inclination to tranquil sleep; eyes regaining somewhat of their natural lustre; lips becoming ruddier and of a livelier appearance, as also the tongue and mouth; diminution of uneasiness, anxiety, alarm, restlessness;

and a return of a healthy appreciation of surrounding circumstances, with slight febrile action.

4. SYMPTOMS OF SUBDUED POWERS IN THE CONFLICT.

As remarked by Cullen in severe agues, the cholera-patient complains of oppressive heat on the surface, and wishes to throw off the bed-clothes, although its temperature is below that of the surrounding air. Increase of involuntary or passive vomiting and purging of a thin watery fluid, similar to rice-water, with white flocculent matter floating in it. The cramps, if any, in the legs, arms, and muscles, increase and become more general; the temples are collapsed; the nose is sharpened; the eyes sunken; vessels of the cornea injected, and often covered with a mucous film; the temperative power of the body is entirely lost, acquiring the property of a freezing mixture, in so far as that it sinks below the temperature of the circumambient atmosphere. The voice becomes feeble, hollow, and unnatural. The tongue and breath preternaturally cold. No saliva is poured in to the mouth, which secretion, like that of the skin, is superseded by an insensible mucous emanation given off from the surface of the body, and condensed, or accumulating as a film on the mucous membranes. The skin, which was before cold, now becomes clammy and covered with large drops of mucous sweat, discoloured, and disagreeable to the feel. The pulse at the wrist and at the carotid arteries is lost, or if it returns for a minute or two, it is small, thready, gliding, and rapid.

The tongue is not particularly foul, but more frequently a nervous tongue; bloodless, as in nervous diseases. The fluid stools, which were discharged from the bowels with a considerable force at the first, now become quite involuntary. No urine is voided. The appearance of the extremities is peculiar, particularly of the superior. The hands and fingers are shrivelled, as if they had been soaking in warm water for a considerable time. The nails are blue, and sometimes there is a blue cast over the whole skin. Any loud exclamations, which may have been uttered during the spasms, gradually sink to a whisper. As in a dangerous cold stage of an ague, if the functions of respiration become unusually slow or oppressed, or very quick and laborious, or the jactitation becomes constant, and the eye retreats in the socket, fixed, lifeless, heavy, and dull, and surrounded by a dark circle; while the spasms, if any, and the vomitings and purgings, suddenly cease; death is nigh at hand.

PROGNOSIS.

The probability of recovery may be judged of by the apparent force of the blow or impression of the poison, and the powers manifested by nature in offering resistance to that blow, just as in a common ague. Whether Asiatic cholera attacks with or without spasms, with or without excessive vomiting and purging, the probability of recovery is to be judged of by the efforts made by nature for the restoration of the circulation, as in fatal agues, now hardly known in this country. If, during the stage of prostration, two

or three hours elapse without the heart making any successful effort to restore even a temporary heat and circulation, the case is scarcely within hope; but periodic attempts, manifested by a return of pulsation and increased heat, from time to time increasing in frequency and intensity, and recurring therefore at shorter intervals, constitute the best ground of hope.

DIAGNOSIS.

The best diagnostic symptom is found in the blood, known by the name of cholera-blood, black, thick, ropy, and slowly effused from the vein—a character pervading the arterial as well as venous blood. The entire absence of bile from the stools, and from the matter vomited; the complete suppression of the secretion of urine and of all other natural secretions; the coldness of the mouth, tongue, and breath; the clonic nature of the spasms, and their uniform absence from the back, loins, and face, are all signs which enable us to distinguish this disease from all others as yet known to us.

POST OBIT. APPEARANCES.

After the most careful and most extensive comparison of post obit dissections of those who have died of this malady, we are led to believe that there is no appearance which might not have accrued after death in the severer cases of fatal agues, as they once prevailed in this country. Corrugated and shrunk state of the extremities, considerable lividity of the surface, dark purplish colour of the lips and

parts not covered by the cutis vera, soft solids, apparently shrunk, eyes sunken, features astonishingly collapsed and ghastly for the short duration of the disease, and the vessels at the surface contracted and bloodless; these, the common effects of violent death, are also the effects of death by cholera, which is a violent death. Large blood vessels, whether in the brain or its membranes, filled with congested, black, thick, and viscid blood, and the same appearance in other larger vessels, is nothing more than what we might expect in a fatal ague, and the separation of gelatinous or fibrinous deposits is common to many diseases where the loss of the vitality of the blood has been most conspicuous. The shrunk, collapsed, and gorged state of lungs heavier than natural, only betrays the excess of the congestion. The traces of redness on the internal surface of the stomach and intestines, only follow upon rapid and violent flux through their coats, just as people's eyes become red by crying, and does not prove the existence of inflammation in those structures; the state of the large intestines, of the gall bladder, of the liver, of the spleen, of the kidneys, corresponds with the accounts given by the old English physicians of the post obit appearances accruing from fatal agues. And among all the accounts of modern dissections of the ravages produced by Asiatic choleric force, we know of none in which greater and more frightful changes have been produced than those which were produced by malarial force on the body of Oliver Cromwell.

If we thought that a more detailed account of the appearances in the several organs and structures of the human body, after death by Asiatic cholera, would avail to facilitate the cure, we should think no time, no pains, too much to be devoted to such a task. But believing that we might just as well consider a detail of the appearances of death after arsenic, or after corrosive sublimate, or after opium, or after any other poison, essential to the adaptation of an antidote, we think that we grasp at all that is essential, practical, and true when we insist, inculcate, and affirm that it is the congestion under poisonous force which destroys in Asiatic cholera; and that it is nature's reaction, aided by the seasonable supply of comforting cordials and medicine, that rescues the sufferer by restoring the circulation from the centre to the periphery. The above account is taken from Annesley and other authors, but modified by my own experience; not very limited, for in the practice of Mr. Edward Weaver alone, in 1832-3, I saw twenty-two cases in the parish of St. Clement's, and parishes adjoining. If I speak as one having authority, I base my confidence, not merely on my own observations, but on a comparison of results and of opinions with those of the first medical officers of all our foreign possessions, many of whom, after their return from long service, have had occasion, as my pupils, to submit their experience to my judgment; and it is notorious, that the first practitioners in this kingdom have thus passed under my review.

